TOR

Vol. XLIV Number 16 PUBLISHED WEEKLY AT THE MALLERS BUILDING CHICAGO, OCTOBER 18, 1923

Thirty-five Cents a Copy Three Dollars a Year

If I were going to write an advertisement to run for ten years without a change, it would contain only the following words:

Regardless of what any other company in this industry thinks or does, the Jordan Company is going to build a better automobile every year.

Edward S. Jordan
President
Jordan Motor Car Company
Cleveland, Ohio

GENUINE BLACK & DECKER PORTABLE ELECTRIC DRILLS

n be easily distinguished in three ways

The well known Black & Decker herwoonal trademark on the nameplate. This trademark is registered in practically every civilized country in the world.

Ine motor case is also hexagonal in shape corresponding with the trade-mark. This makes an exceptionally rigid case and the corners leave open spaces around the motor field making it possible to ventilate and cool the outside of the motor field as well as the inner circumference.



3 "The Pistol Grip and Trigger Switch" is thoroughly covered by mechanical patents preventing its duplication by others, although others have designed portable electric drills which have a handle and switch somewhat similar in appearance. The genuine "Pistol Grip and Trigger Switch" is used by us only, and in two styles as illustrated. The final test of genuineness is to operate the switch. The genuine Black & Decker "Pistol Grip and Trigger Switch" stays "on" or "off.". It need not be held in either position. One pull of the trigger switches the current on, and it stays on until the trigger is pulled again, after which it stays off until again pulled. It is this feature which has made it so popular.

For your own protection we urge that you apply these three tests and satisfy yourself that you are getting the genuine article.

THE BLACK & DECKER MFG.CO.

Towson Heights, :: :: Baltimore, Md., U. S. A.

Branch offices and service stations carrying complete stocks of parts and operated by factory trained men located in

Boston New York Atlanta San Francisco Philadelphia Kansas City

Detroit Chicago Cleveland

Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.



Permanently with

Feltbak

One Set Will Outwear-

3 of Any Other Kind

Corks for Friction . Oil Holes for

Lubrication

Long-wearing **Fabric Protected** by Special



Feltbak Cushions **Braking Action**

Vinder Pressure Saturated Felt Discharges Oil Thru Oil Holes

FORD chatter and vibration can be stopped permanently by using the right kind of transmission lining.

Good oil is essential—but it can't do everytning. Use good oil, but be sure that you are using a transmission lining that will permit the good oil to get to the braking surface under pressure.

Feltbak holds the oil. When you step on the pedals the oil shoots through the oil holes in the corks and onto the braking surface.

It's this lubrication under pressure that keeps Feltbak from glazing and charring—and thus prevents chattering and shivering.

Feltbak stops, starts and reverses with a sure, positive action. Makes a Ford car last longer and saves costly rear axle and transmission repairs.

ADVANCE EQUIPMENT is recognized from coast to coast as the finest made. When you buy an article of our manufacture for your automobile, you are sure that it is the best article for the purpose which money and manufacturing skill can produce.

ADVANCE AUTOMOBILE ACCESSORIES CORPORATION

1721 Prairie Avenue

Manufacturers

ADVANCE CORK
FELTBAK
TRANSMISSION

RED STARTIMER



WHITE STRIPE TRANSMISSION LINING



Trucks, Commercial Cars

ADVANCE ASBESTOS



WHITE STRIPE FAN BELT LARGER CARS



Stretches and "Comes back"



DVANCE EQUIPMEN Every Product the Best of its Kind



They Don't Scrape They Regulate!

PERFECT CIRCLES are oil-regulating piston rings—not oil-scraping rings. The groove on the face of the ring insures positive lubrication at all times—and only the surplus oil is drained back into the crankcase.

PERFECT CIRCLES avoid carbon—stop oil-pumping and give 1000 to 1500 miles to the gallon of oil by their simple, patented principle, which is found in no other ring.

PERFECT CIRCLE Oil-Regulating Rings are standard equipment in 36 automobiles and trucks, including some of the finest motor cars built.

Perfect Circles are making big profits for jobbers and garagemen—because the principle is right—their performance never disappoints—and they are backed by an aggressive advertising and merchandising policy which is constantly creating a still larger Perfect Circle market.

Indiana Piston Ring Company, Hagerstown, Indiana Harkrader & Harkrader: Western Sales Agents 1603 S. Michigan Ave., Chicago



OIL-REGULATING TYPE, \$1.00 EACH

One to a piston
Up to and including 5 in, diameter
COMPRESSION TYPE, 25c and up

Marketed through recognized automotive jobbers, only.

PERFECT CIRCLE
Oil-Regulating Piston Rings

MOTOR AGE

Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave. Chicago, Ills., U. S. A.

Vol. XLIV

Chicago, October 18, 1923

No. 16

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United States, Mexico and U. S. Possession		
All Other Countries in Postal Union	5.00 per 6.00 per	
Single Copies	35	cents

Subscriptions accepted only from the Automotive Trade Entered as Second Class Matter Sept. 19, 1899, at the Post Office at Chicago, Ill., under Act of March 6, 1879.

A Car Agent with Positive Ideas

Two paragraphs—no more. And yet if you wrote a volume could you tell any more clearly or forcefully than this Studebaker dealer has, the reason why some dealers are successful?

on Time Value

"The service which our customers are receiving from Goodrich Silvertowns far surpasses that of any other tires received as equipment on Studebakers.

Consequently, we impose upon you an unusual request, if it will not delay de-liveries. We would appreciate having all cars come equipped with Goodrich Silvertowns exclusively. We feel that in making this request we are doing our customers a great favor—we are en-deavoring to supply them with tires giving the same high grade service as the car they purchase."

DEPOT SQUARE GARAGE
Bath, Me.

We want to add something to that. Goodrich Sales Policy, like Goodrich Quality, never varies. It is solidly based on one big principle—dealer cooperation.

Build, with Goodrich for permanency

The

B.F. GOODRICH RUBBER CO.

Akron, Ohio

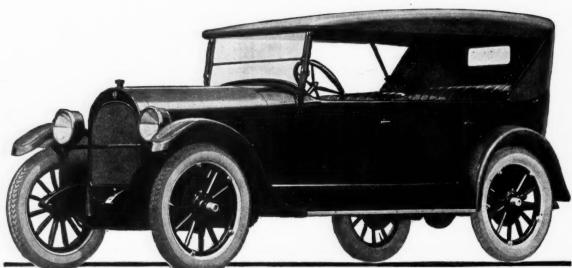
Goodrich TIRES

"BEST IN THE LONG RUN"



A new GENERAL MOTORS achievement~

a SIX at



DSMOBILE - S

An Oldsmobile and a SIX for \$750. Think of it! Here is the car that offers you what you have long been waiting for-the opportunity to sell six-cylinder flexibility, smoothness and power, and at a low four-cylinder price.

And—it is an Oldsmobile. In spite of its amazingly low price, it possesses the beauty and refinement which have always characterized Oldsmobile cars. It gives you a highly developed automobile which is the result of Oldsmobile's twenty-six years of manufacturing experience, reinforced by the unmatched engineering, research and purchasing facilities of the great General Motors Corporation.

We invite you to inspect the new Oldsmobile Six at our nearest dealer's showroom. You will find an achievement in motor cars which is General Motors' answer to the public's demand for a good, but very low-priced six. And you will appreciate instantly its wonderful sales possibilities.

Touring \$750. Roadster \$750. Sport Touring Announce later The G. M. A. C. extended payment plan makes buying easy.

Cab \$955. Coupe \$1035. Sedan \$1095 All prices f. o. b. Lansing.

Tax additional.

OLDS MOTOR WORKS, LANSING, MICHIGAN

Division of General Motors Corporation

Studebaker Appeals to the Whole Market

You cannot expect to get maximum results from your efforts if you ignore any portion of the market.

There is just so much automobile business to be had in your community. Eliminate the lowest price field and the market is divided into three classes — one thousand dollars, fifteen hundred dollars and two thousand dollars and over.

You can't fit the two-thousand-dollar buyer with a one-thousand-dollar car any more than you can cover the one-thousand market with a two-thousand dollar car.

The answer is obvious.

See how Studebaker has made it possible for retail salesmen to get the business in all three classes.

The Big-Six at \$1750 is easily the dominating value in its field and is continually being sold to buyers who want the best regardless of price—and to those who constitute the two-thousand-dollar class.

The Special-Six at \$1350 sells against any five-passenger car made. And the Light-Six at \$995 is without a competitor in the amount of intrinsic value for the money invested. 150,000 Light-Sixes have been sold since this model was introduced three years ago.

With Studebaker, your possibilities are limited only by your efforts. Studebaker dealers are always on the lookout for capable retail men. Better get in touch with your local dealer and if he offers you a chance, take it. Most of the opportunities are found by looking for them.

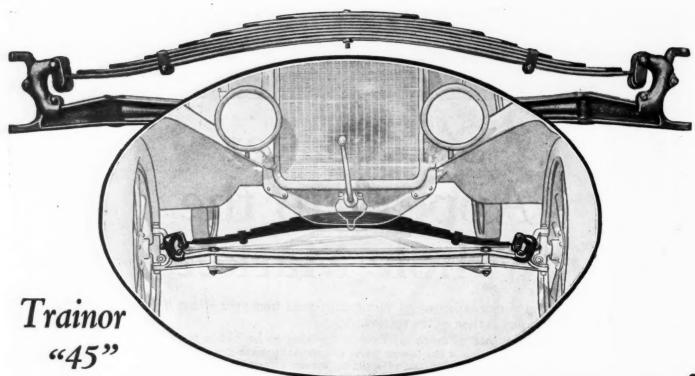
1924 MODELS AND PRICES-f. o. b. factory								
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126'· W. B., 60 H. F						
Touring \$995 Roadster (3-Pass.) 975 Coupe-Roadster (2-Pass.) 1225 Coupe (5-Pass.) 1475	Touring	Speedster (5-Pass.)1835						

THE STUDEBAKER CORPORATION OF AMERICA South Bend, Indiana

STUDEBAKER



THIS IS A STUDEBAKER VEAR



A Remarkable Ford Spring Improvement

TEW riding and driving comfort and greater safety are provided for the Ford owner in the *Trainor "45"*—the 45-inch front springs for Fords. Its extra length—12 inches longer than standard—and its original double sweep design give it a shock-absorbing action never equaled before.

In mud, gravel or sand, or on rutty roads the Ford equipped with the *Trainor* "45" steers as easily and as safely as a heavier car. No jumping of the steering wheel—no lurching of the car from side to side! The *Trainor* "45" absorbs within itself all the ordinary shocks of the road.

Made of high-grade alloy steel—Trainor treated—bronze-bushed—the *Trainor* "45" will outlast many times the ordinary spring, at the same time adding to the life of the car. Like all other Trainor Springs it is backed by the unqualified Trainor Guarantee of satisfaction.

You don't have to wait for springs to break to sell the Trainor "45". Every Ford owner is a prospect for the improved riding and driving qualities it gives. The market is unlimited. Dealers should write for the name of our nearest jobber. Jobbers should write for distributing proposition.

TRAINOR SPRINGS

"The Trainor Way", an improved method of handling replacement springs, is making more money for jobbers everywhere. Write for it.

TRAINOR NATIONAL SPRING COMPANY

NEW CASTLE, IND.

TRAINOR'45" The Shock-Absorbing Front Spring for FORDS



The lowest priced car to operate and maintain now becomes the lowest in first cost in its quality class



New Marmon price, \$2785, phaeton, f. o. b. factory, Government tax additional. Four-wheel brakes optional at moderate additional cost.

Automobile dealers, particularly in small communities, who have always admired the Marmon but have felt that it was beyond the purse average of their patrons are now turning to the Marmon in increasing numbers.

If Marmon is not now aggressively merchandised in your territory write for our analysis of the sales opportunities in your field.

NORDYKE & MARMON COMPANY

Established 1851

INDIANAPOLIS, INDIANA

MARMON

A Line for All-Season Sales





The time established value of the Reo Sales Franchise is greatly increased by the complete line of New Reo High Powered "Sixes" for 1924.

The opportunity to sell the most complete line of motor vehicles in the world is open to only a few; applications will be given prompt and careful consideration.

REO MOTOR CAR CO. Lansing, Mich.

Write for Booklet "Reasons for Reo"

MOTORAGE

IT IS HERE-

that conditions must be right before you can put into successful operation the flat rate system or the piece work plan. No matter how large or how small the shop, it must be first organized both as to men and machinery before work can be sold profitably at a fixed price

Your Shop—The Determining Factor of Flat Rate

Most Concerns Successfully Using Flat Rate System Started to Get Ready a Long Time Ago. Time Study Sheets Valuable in Checking Efficiency. Equipment Plays Important Part and Builds Profits

By B. M. IKERT



We mean by that, that no shop, which at present is working along on a sort of hit and miss basis, can suddenly right about and say, "Tomorrow we shall operate on a flat rate system."

Listen to this. One pretty good sized shop which today is successfully selling maintenance at a flat price for all operations, spent a little over 2 years getting ready.

Certain members of this shop's staff spent several nights each week during that period shaping up things so that eventually the shop could place practically all of its work on a flat price basis. It meant work; lots of it. And

even today that very shop is constantly checking all its work to see if the time limit set for the various operations is running uniform.

Motor Age frequently gets requests from automotive dealers and automotive shops for information on installing flat rate systems. To such we usually have to reply "It can't be done." The real information which will be of value to the shop making such a request must necessarily come right out of that shop.

Your shop is the determining factor in whether or not you can successfully apply the flat rate system to your selling of maintenance and repairs. All the figures in the world on how long it takes to do certain jobs on various makes of cars and

the sequence of operations don't mean a thing, for example, if you haven't the "gang" in the shop with you.

The figures which might be based on a large shop in Cleveland will not fit the conditions of the small shop in Lomira, Wis. The large shop in Cleveland may be able to put its work on a production basis, while the small shop in Lomira may have only two men in it. The big shop may tool up for volume, while the small shop will content itself with hand methods.

Hand Versus Machine Methods

And speaking of hand methods, would you believe that a valve facing and reseating tool would make possible doing a valve regrinding job in 66 minutes, which by the old hand method required in one shop 424 minutes?

Now, it's a cinch that shop equipment plays a big part in the flat rate system; not on all makes of cars, it is true, because on many of the big production jobs it is cheaper to put in new parts. The cost of machining a part on the lower priced cars is usually greater than that of a new part. Hence it is easy to see why shops catering to this particular class are not so completely tooled up with machine tools as are those shops which draw their trade from many makes of cars, both low priced and high priced.

To get back to the valve facing and reseating tool. It will become at once apparent that the shop which grinds in valves by the old hand method and requires 424 minutes for the grinding alone on this particular engine, is going to have a vastly different flat price for the job than the shop which has the tools and equipment to do the same work in 66 minutes. The latter shop, through its ability to handle more such jobs per day, will be able to set a lower time limit and still make money, not forgetting, of course, to charge for the use of the tool

In order that the reader may get a better idea of just how the time is divided in the shop on a typical valve grinding job, two time study sheets are shown. Both time studies A and B exclude all disassembling and reassembling of the cylinder head, removal of valve springs, etc., and are intended to show the actual grinding time only.

In the case of the time study A, most of the valves in this particular engine needed only a touching up and are, therefore, charged with only a few minutes time. However, it will be noted that number 9 valve required 36 min.; number 12, 58 min. and number 7, 274 min. before it seated properly. Thus one valve required more time than all the other eleven.

The man who made these time studies is of the opinion that if the valve seat for this valve had been cut down properly with a good reseating tool to a 45 deg. angle, a very few minutes grinding would have given it a perfect seat.

The valve grinding job in time study B was made with the aid of a Kwik-Way valve facing machine and reseating tool. As to the valves in the engine on which time study B was made, none of them were in good shape, while in time study A, most of the valves were in fine shape. The valves in B for the most part were badly pitted and the one designated as number 12 was badly warped and in most cases would have been thrown away. Inspection showed that all told the job done by the mechanic in time study B was the better of the two.

Aside from telling the story of just how much difference proper equipment can make in maintenance and repair work, these time study figures give an excellent idea of how one must go about it to collect data for the establishing of a flat rate system.

What Time Studies Really Are

These time studies are not made with the idea of a mechanic setting a world's record for any particular job. They are simply a faithful recording of everything that a mechanic does and it means that a man with watch, pencil and pad must check the mechanic. It would be difficult for a mechanic to write out his own time study record and the chances are he would leave out many things which the skilled time study

The piece work plan of operating shop, which is the logical outcome of the flat rate system, makes it imperative that the mechanic have not only the sequence of operations for a par-

Time Study Sheet A

		Time	
		finished	Minutes
1.	Began 10:19 A. M. 8/20/23.		
2.	Grind No. 1 Valve	10:24	5:00
3.	Grind No. 2 Valve	10:28	4:00
4.	Grind No. 3 Valve	10:32	4:00
5.	Grind No. 4 Valve		5:00
6.	Grind No. 5 Valve		25:00
7.	Grind No. 6 Valve		4:00
8.	Scrape carbon		8:00
9.	Personal delay		12:00
10.	Scrape carbon	11:30	4:00
11.	Grind No. 7 valve (not finished)	12:00	30:00
12.	Resume work on this job. P. M	1:00	
13.	Grind No. 7 valve (Valve won't seat		29:00
14.	Get requisitions for and secure no		20.00
14.	valve, from stock room		11:00
15.	Grind No. 7 valve. (New)		43:00
16.	Looking for finer compound	2:20	7:00
17.	Grind No. 7 valve	2.47	17.00
18.	Conference with Foreman about No.		******
100	Foreman files valve down. (2 men		16:00
19.	Grind No. 7 valve		15:00
20.	Other work (decided on return to		10.00
20.	No. 7 go as it is for a while a		
	come back to it after the other		
	were done)		
21.	Grind No. 8 valve		3:00
22.	Grind No. 9 valve		36:00
23.	Grind No. 10 valve		3:00
24.	Cried No. 11 Value	4.54	3:00
	Grind No. 11 Valve		3:00
25.	Returned to work after supper		FO -00
26.	Grind No. 12 valve		58:00 124:00
27.	Finish grinding No. 7 valve	9:02	124:00
	Tr.	otal tim	0 100
		out time	C 100
	SUMMARY		
Gri	nding valves		424:00
	ape carbon		
	sonal delays		
	ck chasing		
	l time		

This grinding job was done in the old way using a screwdriver twirled between the hands. Number 7 valve obviously was a sticker, but a valve reseating tool and facing tool would have cut the time factor down as it did in time study sheet B

Total time 466:00

ticular job, but he must also have on hand at the start all the tools and material he is likely to need on that job. He must organize for the job. And that is where the time study sheets of any operation are of value.

One never knows just where the time goes in the shop until time studies are made. You may find, as did one shop, that its mechanics were spending many hours per week just getting parts from the stock room. Ordinarily it did not look serious for a mechanic to be going to or from the stockroom, or to have him standing at the stockroom window, but it was serious when that shop, after making a series of time studies on various jobs, found that it took 25 minutes to get a brake anchor bracket from the stockroom.

Time studies show up lost time in various ways and indicate to the service department exactly those phases of the business which require revision.

For example, in time study A, certainly it becomes at once apparent that something is wrong when it takes over 4 hours fussing with one valve to get it in proper shape. Where no time study is kept on a job like this the mechanic probably would simply have said that he had had a lot of trouble with number 7 valve and let it go at that. But when you see on the time study sheet that the other valves required a

MOTOR AGE

11

Time Study Sheet B

Valve head previously removed from motor and valve springs taken off, head resting on bench with valve heads up.

	ls up.	14410
	Time	
	finished Mi	nutes
1.	Began 1:22 P. M. 8/22/23.	
2.	Scrape carbon off head block and	
	valves 1:43	21:00
3.	Face valve No. 1 on machine	4:00
4.	Face valve No. 2 on machine 1:50	3:00
5.	Face valve No. 3 on machine 1:52	2:00
6.	Face valve No. 4 on machine 1:55	3:00
7.	Face valve No. 5 on machine 1:59	4:00
8.	Face valve No. 6 on machine 2:02	3:00
9.	Personal delay 2:04	2:00
10.	Face valve No. 7 on machine 2:06	2:00
11.	Face valve No. 8 on machine 2:07	1:00
12.	Face valve No. 9 on machine	2:00
13.	Face valve No. 10 on machine	2:00
14.		1:00
15.	Face valve No. 12 on machine 2:18	6:00
	(Valve No. 12 was very badly warped.)	
16.	Cut down seats with reseating tool 2:22	4:00
17.	Apply compound to faces of valves	
	and plane valves in head 2:25	3:00
18.	Grind valves in head with screw	
	driver twirled between hands 2:34	9:00
19.	Squirt thin oil around valves and give	
	them finish polish 2:37	3:00
20.	Remove all valves, clean up valves	
	and head with cloth and gasoline:	
	apply blue to valves 2:47	10:00
21.		4:00
	Total and or interest to be dealing that the or and a second	
	Total time	89:00
	SUMMARY	
Val	ve grinding	66:00
	ape carbon	
	sonal delays	

The valves in this engine were in far worse shape than the valves of the engine in sheet A. Notic how the valve refacing tool and reseating tool cut the time factor. A properly tooled shop will have less difficulty in getting its service operations on a bed rock basis, because the time factor will vary less

few minues and then number 7 comes along with a total of 274 minutes. Zowie! No wonder this shop looked around for a machine to do the work quickly and accurately.

But the sad part of it is that there are hundreds of shops

today which spend as much or more time on valves yet have a sign out "Expert Repairing" and even decide to operate on the flat rate system.

We congratulate those who want to operate on the flat rate system. In fact, we believe there are shops which can quickly get on a flat rate basis. They may get their time limit too high or too low, but all that can be ironed out as the operations are more frequently performed.

But to those who ask us for information on how to start a flat rate system, let us extend the advice that they first make sure that their shops are run on a basis that makes the flat rate possible.

One thing to do, whether you have two or two dozen men in your shop, is to find out how long these men have been in your employ. If you find that all or most of them have been with you for a long while it is pretty safe to assume that they are "sold" on your ways of doing business with them. Consequently you stand a good chance to talk over any new idea with them and, naturally, the oldest men, that is those who have been with you the longest, are the ones to talk the plan over with first.

The men in the shop must by all means be totally sold on any new plan and if it is put to them in the right light, it is surprising how they will take to the idea.

Shop Personnel Is Important

If you have a large turn-over of men in the shop you will have difficulty establishing a flat rate system and making it pay. You must have the mechanics with you. They must be in full sympathy with the system. You must talk it over with them before you decide to put it in, especially if you are going to put the men on piece work. If you just go ahead and decide the piece work plan is what you want and stick up a sign in the shop that "henceforth all operations will be done on a piece work basis," probably all or most of your men will simply up and quit. They have done this in other shops and you cannot blame the men.

Remember that we said at the beginning of this article that one concern spent over 2 years just getting ready to put the flat rate system in its shop. It meant not only compiling reams of data, but holding meetings with the men and getting them sold on it. Then, when the time came everyone in the organization knew what it was all about and naturally it worked out well and is going better than ever today.

We believe car manufacturers can help a lot in the way of making time analyses on various service operations on their cars. They can work out the one best way to do a job and incorporate this in their service manuals, as some already are doing. Many factories have a time study expert in their organization who might be induced to check up on operations in the service department. While this is not as good as making time studies in local shops, it would be of help and give the local man something to shoot at

local man something to shoot at.
(We are indebted to A. G. Trembly, time study observer of the Stephens Motor Car Co. for the data used in this article).

It Might Have Been You

NCE there was a motorist whose three children were injured for life just because no one who was in the car at the time of the accident knew just what to do.

If there had been a single person who had learned First Aid in that luxurious limousine those children could have been saved. As it was, when a surgeon hurried to the scene, it was too late.

You may know all about your carbureter, your steering gear and every intricate part which makes up the perfect machinery of your motor car.

But do you know how to prevent a tragedy when you are in an accident?

Because the American Red Cross wishes to teach motorists and everybody else the vast importance of this knowledge, it has resumed its First Aid Instruction Service. First Aid Instruction Car No. 1, a car of the standard Pullman type, ingeniously equipped with a lecture room, seating fifty people at one time, living quarters for the surgeons and attendants who will make it their home during the tour, and so arranged that it can be quickly turned into a hospital for transportation of thirty patients in a case of serious disaster, is now making its tour on the Baltimore and Ohio Railroad. The car will be out until December 21, and all along the way from Baltimore to Chicago will teach First Aid.

Total time 89:00

Such instruction will insure your safety in time of accident.

Join the Red Cross during the Roll Call, to be held from Armistice Day to Thanksgiving, and help to spread this knowledge.

SAFETY TO BE CAB TOPIC

CHICAGO, Oct. 12—The National Association of Taxicab Owners will devote one day of its convention to be held here this month to plans for the reduction of accidents in the operation of taxicabs. The convention will be held Oct. 17, 18 and 19 at Hotel Sherman and the safety discussion will take place the first day. About 125 members are expected to be present.

In order to get practical ideas of safety requirements the association is urging the members to bring with them the chief of police of the principal traffic officer of their respective cities, and John Hertz, president of the Yellow Cab Mfg. Co., has agreed to pay the expenses of these officers.

Dort Changes Body Lines in New Models

Bodies Appear Longer and Built Closer to Ground. Radiator Design New. New Rear Axle and Easier Steering Characterize Chassis. Engine Refined in Details Only

ARGER, roomier bodies have been mounted on lowered frames in the new Dort six cylinder car. Radiator and hood lines have been modified to replace the former sharp corners and flat surfaces by curved lines at the top, sides and intersections. Production is to be concentrated on the six cylinder line, the four cylinder model having been discontinued.

Changes in Propeller Shaft

Mechanically, the new car is similar to the former six cylinder model. The same engine, a Falls having six cylinders of 3½ in. bore and a stroke of 4½ in. is continued with a Detlaff clutch and gear set of Dort manufacture. The former enclosed propeller shaft and torque tube construction has been replaced by an open propeller shaft and hinged torque arm. Thermoid-Hardy universal joints at each end of the tubular propeller shaft have replaced the single metallic universal joint that ran within the yoke at the front end of the torque tube.

Although the cantilever spring construction at the rear and the same wheelbase, 115 in. is maintained, the former straight frame side members have now been swept up 3 in. over the rear axle. This modification with the flatter rear springs has resulted in more pleasing, better balanced, body lines and somewhat better riding qualities.

Generous passenger capacity has been the keynote of the design of all the new bodies. Leg room has been increased in both the front and rear compartments and the width of the seats provides ample room for the rated number of passengers of more than average size. With the exception of the regular five passenger touring car, each model is provided with an unusual amount of auxiliary and accessory equipment.

Five Models in Line

The complete line now consists of the following models:

Standard five passenger touring car at \$1,095.

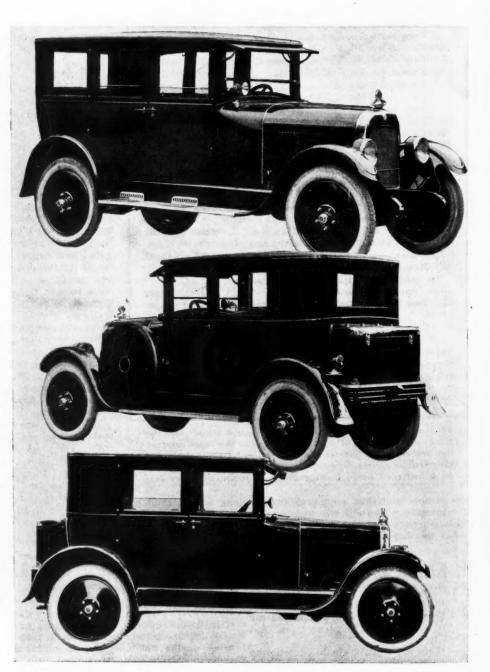
Sport touring car at \$1,245.

Five passenger three-door coupe at \$1.535.

Five passenger three-door brougham at \$1,535.

Five passenger sedan at \$1,595.

Nickel plated radiators, cowl ventilators and 31x4 cord tires are standard on all models. The touring car is finished in black paint with green leather upholstery and has wood wheels. Inci-



Dort line of enclosed cars, top to bottom, the sedan, brougham and three-door coupe.

These cars carry a complete line of equipment

dental equipment includes foot and robe rails, rubber mat on the front floor boards, 18 in. steering wheel and gasoline gage on the tank.

In addition to the regular equipment, the sport touring model is fitted with a front bumper, Moto-Meter and bar cap, parking and stop lamps and Clymer spot lamp in the one-piece windshield which carries an automatic cleaner and rear view mirror. The tire carrier on the left front fender is equipped at the factory with a spare tire and cover. This model is finished in blue paint with Spanish leather upholstery and has a trunk rack at the rear. Disc wheels are also standard equipment. Dash gasoline gages are standard in all.

External appearance is the same for the five passenger coupe and the five pas mod doo full a fi ing two

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passenger brougham. Each of these models has two front doors and one rear door at the right side. In the coupe, a full width rear seat is supplemented by a fixed bucket seat and hinged disappearing seat at the front. The brougham has two full width seats. The rear seats in both these models may be removed to provide baggage or luggage space.

These models are equipped in the same measure as the sport touring and a trunk is included. Heaters and Dura window regulators are provided in all the closed models. With the addition of the five passenger sedan, which is a four-door model equipped along the same lines, all closed cars are finished in blue paint up to the belt line and in black paint above, the interiors being finished in gray velour.

Importance of Statistical Study

THE days of becoming a millionaire in twenty-four hours never have existed and never will, at least in the lives of those who cannot see beyond the tip of their nose," says the Business Consultation Bureau of LaSalle Extension University in a recent report, discussing the importance of statistics in analyzing business situations.

"The study and understanding of statistics, one of the chief means of helping a man to look ahead and make his plan for future progress on the basis of what has happened in the past, comes only through long practice and careful observation. To explain how the different

Some of the Items Which Make Suitable Christmas Gifts

THE current number of The Automotive Equipment Merchandiser prints a list of items which it suggests the automotive accessory dealer or department can push for the Christmas trade. A number of manufacturers are putting these items into Christmas boxes to make them self-suggestive. Any dealer can do the same thing by buying some holly paper and fancy wrapping cord or tape. This issue of The Merchandiser also il-

lustrates the various signs that have been arranged for use of dealers and tells how to obtain these helps for the "Something for the Car for Christmas" movement. If you did not get a copy of The Merchandiser and you want one, write to the Merchandising Department, Automotive Equipment Association, City Hall Square Building, Chicago. The list for suitable Christmas gifts follows:

BODY EQUIPMENT

Backing Lamps Bumpers Dome Lights Flashlights Lamps
Luggage Racks
Radiator Caps Search Lamps Signals Stop Lamps Ventilators

Accelerators Foot Accelerators
Lubricating Systems
Shock Absorbers Thermostats

Bulb Kits Ignition Gauges Radiator Heaters

Assortment Kits
Camp Grids
Cleaning Specialties
Grease Guns
Pliers
Work Suits

Chain Jacks Rim Tools

Windshield Wings Battery Boxes Cushions Door Pockets Head Lamps Radiator Covers Searchlights CHASSIS EQUIPMENT

Bounce Absorbers Gauges Oil Gauges Sirens Cut-Outs

ELECTRICAL EQUIPMENT

Cigar Lighters Spark Plugs Spotlights

Auto Polish Canteens
Fire Extinguishers
Hammers wdrivers Bulb Cas

Chains Tire Gauges Wind Deflectors Brake Mats Dash Lamps Draft Shields Heaters Luggage Carriers Mirrors Radiator Meters Side Lamps Step Mats Tool Boxes

Grease Guns Primers Speedometers Exhaust Horns Heaters

Motor Horns Lamps Flashlights SUNDRIES

Chairs
Gasoline Kits
Luggage Carriers
Steering Wheel Warmers Camp Grates TIRE SUPPLIES

Jacks Tire Covers

Windshield Cleaners Bulbs Dome Lamps Fire Extinguishers Horns Luggage Carryalls Parking Lamps Rain Shields Signal Lamps Signal Lamps Step Plates Trouble Lights Windshield Visors

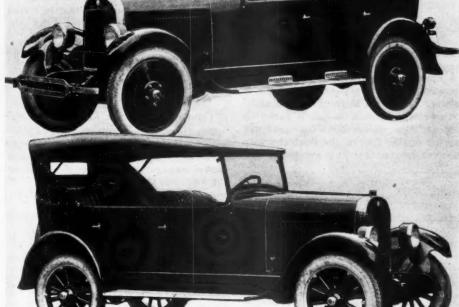
Rebound Absorbers Stabilizers

Timers

Cleaning Materials Golf Bag Holders Overalls

Pumps Vulcanizers

You Tell 'Em-Something for the Car for Xmas.



The two open models of the new Dort, the touring and sport touring, the latter is equipped with disc wheels

laws work out and to give the meaning of the ups and downs of a certain security is the same as trying to explain the action of the heart without knowing something about its relation to the other parts of the human body.

"For many persons, figures are just abstract things, while to those who can read and interpret them, they are almost human beings, telling you day by day the history of an organization or a nation's progress. Take, for instance, the price of an ordinary U.S. bond. Just why is it that at times, during a term of years, the price of this bond has been \$75, at other times \$90, and still at others, \$100? What is causing this fluctuation? Is it the security behind the bond, or the income it brings in a year?

Take the question of wages. Why is it that three years ago people in the United States seemed more prosperous than ever before in their entire history? Compare the situation with the experience we had a year ago. What conditions created all that unemployment and how about wages, the purchasing value of such wages? Has income anything to do with the commodity prices? When wages go up, are commodity prices going up or coming down? When labor becomes scarce, what happens to wages? Have statistics on immigration anything to do with labor and wages?

"Statistics of any kind must be interpreted in the list of a good many economic factors, the workings of which must be understood to permit the best planning.

New Stewart-Warner Carbureter of the Plain Tube, Fixed Jet Type

Butterfly Valve For Throttle Is Located in Air Intake in Place of Mixing Chamber, For Purpose of Eliminating Condensation

THE Stewart-Warner Speedometer Corp. has started production on a new, plain tube, fixed jet type of carbureter which carries the throttle butterfly in the air intake in place of above the mixing chamber as usual.

The new position of the throttle is for the purpose of eliminating condensation, due to the mixture striking the butterfly plate. Incidentally, this location of the throttle has been found to make the carbureter meter inherently, due to the variation in the partial vacuum existing above the jet.

Function of Air Jet

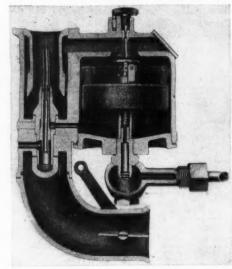
Another unusual feature is the air jet which does not function in the usual manner, but is incorporated in the carbureter structure solely to atomize and spray the fuel. Due to the partial vacuum existing inside the carbureter, because of the position of the throttle, a stream of air is drawn into the annular space surrounding the base of the air jet and up through the center of the nozzle shown in the sectional illustration. Because of the location of the throttle plate, the smaller the throttle openings at any speed the greater the vacuum.

The velocity of the air through the nozzle of the carbureter is high, due to the restricted passage. At average running speeds, it attains its critical velocity, 1,100 ft. per sec. The upper end of the air jet is designed so that it functions similarly to a steam injector, the high velocity column of air rushing out of the nozzle causing a partial vacuum to be applied to the upper end of the fuel metering slot. Therefore, the fuel is drawn in, atomized by the high velocity air stream and then thrown into a conical shaped column of narrow angle into the manifold in the Ford system or into the manifold in the ordinary installation. In the Ford outfit, the vaporization is completed by the highly heated fins contained in the manifold vaporizer.

Fuel is forced through the metering slots by the pressure difference existing between the float chamber and the carbureter throat. The principle used to provide the metering control in the Stewart-Warner carbureter is the law that whenever a continuous column of any moving fluid has its velocity increased, due to passing through a second and smaller area, the pressure is decreased by an amount which is proportioned to the reduction of area. The greater the velocity of the fluid the greater is the pressure difference existing between two points of different cross-

sectional area.

Fuel Forced Through Metering Slots



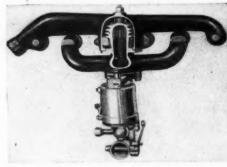
Cross section of the Stewart-Warner carbureter. This shows the location of the throttle butterfly in the air intake

Applying this to the carbureter, the pressure at a point of relatively large cross-section is communicated to the float chamber through a large equalizing passage, so that the pressure on the surface of the fuel in the float chamber is that existing at the throat entrance. The fuel in the metering box, which communicates with the bottom of the float chamber, normally stands \(\frac{1}{2} \) in below the top of the air jet opening. The air pressure existing on top of this fuel column is that existing in the throat.

Air Velocity Increased

It is the function of this throat to increase the velocity of the air through the cross-section and thus decrease the pressure of the air passing through it relative to the pressure at its entrance.

Therefore, as soon as air is taken in through the carbureter, the pressure exerted on the fuel in the float chamber becomes greater than that exerted on the



The Stewart-Warner carbureting system for Fords, showing a cut-away of the hot spot arrangement

fuel in the slot. As a result, fuel is forced from the float chamber through the slot and into the annulus, from which point it is picked up and sprayed by the air jet.

As the throttle of the carbureter is opened and the amount of air passing through the carbureter is increased, the velocity through the throat must necessarily increase, which consequently increases the pressure difference between the float chamber and the float, resulting in an increased fuel flow. Thus, the fuel flow is entirely automatic and independent of mechanical devices.

Mixture Proportions Changed

A claim made for this carbureter is that it has been so designed that, at all speeds and loads at which the throttle is not fully opened, the fuel-air mixture proportions are those that will give maximum economy. It is claimed however, that when the throttle is opened wide and the engine called upon to deliver its maximum output, the mixture proportions are inherently changed to those that cause the engine to deliver its maximum output.

There is only one adjustment on the carbureter and this is for idling. consists of an air vent into the float chamber, the size of the vent being determined by the setting of a knurled adjusting screw. When the vent is opened, the pressure in the float chamber is slightly increased and consequently a slightly larger amount of fuel is forced through the metering slot. As the throttle is opened, the vacuum in the intake manifold decreases, the leakage through the valve guides decreases and also less air is drawn in through the adjusting vent, causing a smaller pressure increase in the float chamber.

Compensating for Lean Mixture

The increase in the float chamber pressure is directly proportional to the vacuum in the manifold, and as the valve guide leakage is also proportional to the vacuum, the device compensates for any leaning of the mixture, due to leakage.

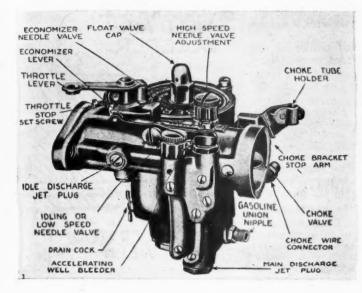
For Ford cars, the Stewart-Warner company is marketing a manifold in connection with the carbureter. The manifold has a hot-spot which is so designed as to completely vaporize but not to super-heat the fuel and to evaporate the end points of the fuel while keeping the charge temperature relatively low. A manifold is shown sectionally herewith.

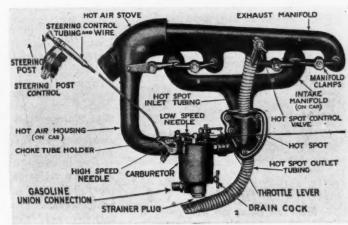
Only the fuel in the mixer enters the vaporizer. The air does not do so on account of the fact that the vaporizer is

(Continued on page 16)

The Stromberg Special Carbureter for Ford Cars

Hot Spot Manifold as Part of the Carbureter Installation Facilities Obtaining Proper Combustion from Present Day Motor Fuel





Left: External appearance of Stromberg Model OF carbureter for Ford cars

Above: As the carbureter appears when installed with hot spot

HE model O. F. carbureter, put out with hot spot manifold for Ford cars and in similar types adapted to other popular cars, contains a number of features which should be of interest to those who wish to know what they are doing when they turn the little screws on the customer's car.

Many a mechanic has been called out on a job and has had to bluff his way through, guessing at the adjustments and hoping the car owner would not get next to the fact. Especially desirable is a thorough knowledge of this Stromberg carbureter, for a superficial inspection might lead one to mistake the high speed adjustment for the low, and the consequences would accordingly be far from satisfactory.

The general appearance is shown in Fig. 1, while the way it looks when on the car, with the new exhaust manifold and hot spot around the intake, is shown in Fig. 2.

Gasoline comes into the carbureter through a strainer, as shown in Fig. 3. and goes up through a needle valve to the float chamber. The strainer is held in place by a coil spring, which in turn is held up by a large hex nut. This nut can be removed from the carburetor, when it is desirable to clean the strainer.

If the engine runs a little while and then stops or runs steadily at low speed but not at higher speed, it may be due to an accumulation of dirt on this strainer, which of course, would prevent proper flow of fuel to the carbureter. An indication of such a condition is found by removing the round topped needle valve cap on top of the float cham-If the needle valve is down as far as it will go it shows that the carbureter is full of gasoline, but if it is up it shows

that the carbureter is partly empty, and is not receiving the normal supply from the tank.

In addition to the strainer for removing sediment from the fuel, the carbureter is provided with a drain cock, as shown at the left in Fig. 3, for removing water from the float chamber.

Where the Gas Goes When Idling

All of the gasoline used at any speed goes through the high speed needle valve, shown in Fig. 4. Note that this location for the needle valve is in many carbureters used for the low speed needle valve, while additional air or gasoline adjustments are made at higher speeds. In the Stromberg carbureter the practice is quite different.

Gasoline through this needle valve goes down and to the left to that portion of the carbureter under the main discharge jet. It then flows again to the left as shown in Fig. 4, to the idling tube, and up this tube to the idling cnannel. To

see where the fuel goes next we will refer to Fig. 5. Here we see an end view of the idling tube, for we are looking down on the carbureter which is shown in section.

The gasoline coming up through this idling tube now goes to the left through the idling channel, and then enters the passage by going through the idling discharge jet, which is just ahead of the throttle when the throttle is closed.

The flow of air for normal running conditions is through the choke valve, shown at the right in Fig. 5, and then through the throttle to the intake manifold. However, with the throttle closed, this flow of air is practically shut off, so that nearly raw gasoline would be drawn through the idling discharge jet.

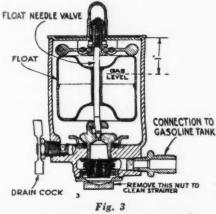
This would do for the first few power strokes of the engine when starting, but the engine could not run on this rich

The Low Speed Adjustment

It is at this point that the low speed adjustment gets in its good work, for it permits air to mix with the gasoline flowing through the idling channel, so that when the fuel passes from the idling jet to the main air passage, it is a combustible mixture, rather than raw fuel.

Where the Gas Goes at High Speed

As the throttle is opened, the suction at the idling discharge jet becomes less and less, while at the same time air is drawn from the hot air stove, and past the choke valve, where it draws up fuel from the main discharge jet. Gasoline for this jet, like that for use at low speed, comes from the float chamber through the high speed needle valve, going down and to the left. It then goes



Strainer and float chamber

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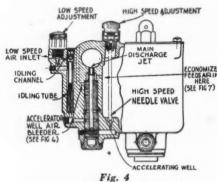
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straight up and is drawn from the main discharge jet by the air flowing through the narrow part of the air passage or venturi, as it is usually called.

Stepping on the Gas

With the type of carbureter that has a single needle valve adjustment only, it will often be found that the car does not accelerate as it should. The needle



Main and idling gas passages

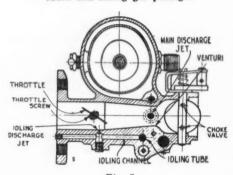


Fig. 5

Horizontal section showing main air passage and discharge jets

valve setting which gives a proper mixture at medium high speed, gives too lean a mixture for rapid pick-up in speed, where a richer mixture is required.

To facilitate rapid acceleration this carbureter has a small reservoir built around the main discharge jet. A number of small holes drilled radially from this jet allow this well to fill up under ordinary conditions of running. However, sudden acceleration and the additional suction thus produced draws this extra gasoline up through the jet to give a suitable mixture.

When a gravity tank is used on an automobile, a vent hole is needed in the filler cap for, if air does not get in at the top, the gasoline can not get out at the bottom. In the accelerating well a similar air vent is needed, for the gasoline can not be drawn up unless air can get in to take its place.

This air vent, or bleeder, as it is called, is shown in detail in Fig. 6. From the side of the carbureter a hole is drilled into the upper portion of the accelerating well, the end of this hole being plugged. Another hole is then drilled from the top to connect with the first hole and a screw is put in the top of this hole. The screw however, has two holes in it forming a small T-shaped

air passage, through which the necessary air can flow.

What the Economizer Does

Most carbureters draw through their main discharge jet a stream of clear gasoline. In this carbureter however, the gasoline is aerated, or air impregnated, at all but the highest speeds, by the action of the economizer.

The economizer is shown in detail, together with its connection with the main discharge jet, in Fig. 7.

Air is taken from that portion of the main air passage just back of the choke and mixes with the gasoline in the main discharge jet. When the choke is in use the economizer becomes practically inoperative. The action of a spring tends to hold the economizer needle valve on its seat, but under normal conditions of operation is prevented from doing so by a flat cam on the throttle arm. This action is seen in Fig. 1, where the cam operates against a roller on the economizer lever, the right end of which, in the form of a hook, serves to hold the needle up so that the valve is open.

When a speed of from 25 to 30 miles per hour is reached however, the throttle has been opened to the point where the cam is no longer acting to hold the valve off its seat, so that in this way a proportionately richer mixture is made available to give the maximum power at high speeds.

Adjusting the Carbureter

If the mechanic has a thorough knowledge of what happens in the carbureter he does not need much additional information to enable him to set one properly. If the adjustments have not been touched since the carbureter was received from the factory, they are approximately correct for starting the engine. However, if they have been disturbed they may be reset as follows: Screw the idling jet adjustment inward or clockwise until it seats, then unscrew it one turn. Also screw the high speed adjustment down or clockwise until it seats, and then unscrew it two and onehalf turns. The engine should then be started and allowed to run until warm.

The hot spot attachments with this carbureter will materially reduce the

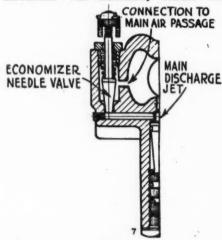
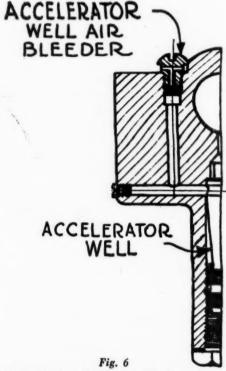


Fig. 7

Sectional view showing connection of economizer to main discharge jets

time required to get the carbureting system to a proper operating temperature.

After the engine is thoroughly warm, move the steering post control down so that the engine runs slowly, and, if it does not hit evenly, screw the low speed adjustment in, or clockwise, for a richer mixture and out for a leaner mixture



Sectional view showing air bleeder connection to accelerating well

until the adjustment is obtained where the engine runs best.

For high speed adjustment open the throttle lever on the quadrant about one inch and advance the spark to the regular running position. Then turn the high speed adjustment down or clockwise until the engine runs slowly showing a lean mixture and loss of power. Then turn in the other direction until engine runs smoothly and at maximum speed for this throttle setting. Then turn the screw down or clockwise one or two notches to slow the engine down slightly.

With this setting the economizer device will change the mixture to give full power at wide open throttle.

(Continued from page 14)

of pockets only opened at the mouth. Vapor formed in the heated chamber flows out over the incoming fuel spray, and gives up a portion of its heat directly to the fuel globules. In this way, the temperature of the vapor is cooled down to a definite value, no matter how hot the vaporizer may be.

In other words, the vapor always being in the presence of its own liquid cannot be super-heated. Upon mixing with the air in the intake manifold, the hot vapor causes a rise of temperature above that of the atmosphere. This is claimed to result in an inherent regulation of the vapor temperature.

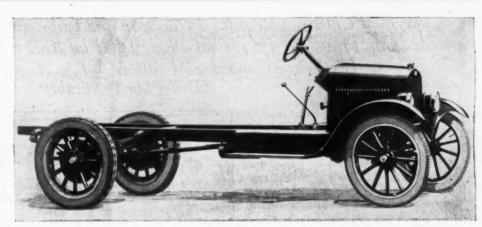
From the Field of Motor Vehicle Development

Gray Announces Light Truck

THE Gray Motor Corporation, of Detroit, announces the Gray Truck to round out and complete the line of Gray passenger cars.

Several features of the Gray truck are new and rather unusual in light truck construction—such as the long and rigid frame with its two tubular cross members, unusually large brake drums, heavy construction of the rear axle and differential housing, and the low speed, low compression engine.

The rear axle is a semi-floating, with a standard ratio of 6½ to 1. The differential is removable with the axle in place. Tires are non-skid pneumatics, the front being 30 by 3½ and the rear 32 by 4½.



Chassis of the new Gray Light Truck, which has a 120-in. wheelbase.

Equipment includes generator, starter, battery, drum type headlights, combina-

tion dash and instrument board, front fenders, etc.

Reo Tool Compartment Doors Made Accessible



A COMPARATIVELY simple refinement, yet one destined to bring comfort to the motoring public is the side-entrance tool-compartment built under the front seat of the new Reo Six, five passenger, touring car.

Because of the wide doors on the Reo it is possible to provide good-sized entrances to the tool compartment on each side. These entrances have been fitted with well-built doors and the doors are in turn fitted with locks.

More usable space is obtained through the new method of gaining entrance, and room may be left in the compartment for storing small packages while the car is parked. with an intermediate wood spacer are mounted on the wheel hub. A rubberized laminated fabric ring is riveted between the outer circumferences of the two steel discs. At its outer circumference, the fabric ring is bolted into the inner portion of a detachable rim construction which carries a conventional detachable rim that is attached by means of a wedge ring, lugs and nuts. Due to the flexibility of the fabric ring, the weight of the car is carried in suspension from the upper half of the rim.

New Models Announced By Duesenberg

MATERIAL improvements have been made in the appearance of the Duesenberg for 1924. The cars are distinguished by two color paint combination with individual striping of distinctive design.

Mechanically the only important change is the increased diameter of the crankshaft which is now 2¼ in. instead of 2 in. The front compartment has been made cooler by running the exhaust pipe forward instead of back.

A new 4 or 5 passenger phaeton has been added. This is a high side type with the tire at the rear and no trunk. It has extremely deep upholstery, the depth being 11 in. in the back and 15 in. for the seat. The car has been designed to be the utmost in comfort and carrying capacity. It has 134 in. standard wheelbase and the body is so laid out that trunks can be carried on the side if desired. This is a Rubay built body selling for \$6,500, list.

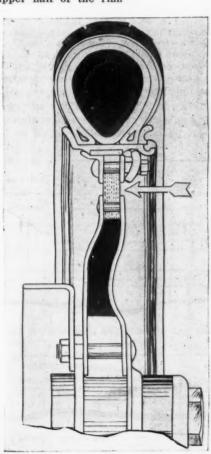
Another new body is the Imperial sedan selling for \$7,500. This is also a

Rubay job featured by piano hinged door, dropping glass behind the driver's seat. The body has seven-passenger capacity and may be had in various color combination stripings. The four-passenger, four-door coupe has been modified so as to give two inches more in the front compartment and three inches more in the back.

Flex-sil-ient Wheel

NEW form of wheel construction has A been introduced by the Newport News Shipbuilding and Dry Dock Corp. While this wheel has much the same appearance as the conventional disc wheel, it is unique in having a laminated rubberized fabric incorporated into its construction as illustrated. It is claimed that the flexible characteristics of this ring produce longer car life with attendant easier riding and greater freedom from squeaks and rattles. It is also stated that vertical and laterial shocks are absorbed to a greater extent and that tire life is increased by about 30 per cent due to the increased flexibility.

As illustrated, two formed steel discs



Case Company Develops Definite Service Plan for Dealers

System Calls for Regular Inspection and Lubrication for First 3,000 Miles Car Travels. After That There Is a Flat Rate Charge for Continued Inspections and Lubrications. Los Angeles Dealer Has Used Plan Profitably

N the belief that every purchaser of a Case car is entitled to dollar for dollar value the J. I. Case Threshing Machine Co. has developed a definite, tangible service, based on its knowledge of its cars in the process of building and in the hands of owners.

The service plan, incidently, has been used with success by Gail Vanderbraak, Case dealer in Los Angeles and, among other things, this dealer has found the following to be true:

1. Every customer is satisfied with the service and performance of his car.

2. Increased sale of cars because of good service.

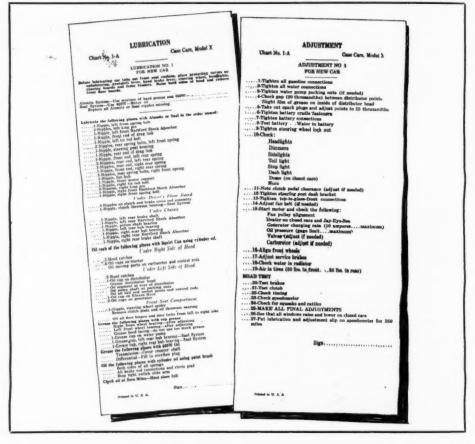
3. He is serving practically every car he has sold in Los Angeles, and many owners of other makes of cars are seeking this kind of service from him.

4. He is making profit on all service. This service plan provides gratis service to the owner for the first 3,000 miles of use after which a flat charge for each 3,000 mile period is made averaging about \$45 per car for each 3,000 miles of use.

New Car Inspection

When a new car is received by the dealer, it is gone over thoroughly according to chart 1-A, "Lubrication and Adjustment Chart" at Zero Miles. It will be noticed that every precaution is taken to protect the finish of the car by covering upholstery, fenders, levers, etc. This practice is followed when any service is done on a car at any subsequent time.

All operations, whether oiling or in-



The operations listed on these charts are those performed on a new car before its delivery to the customer. It will be noted the operations are progressively performed from one side of the car to the other, thus materially conserving the time of the mechanic

			Completion Free Service	Motor No	Generator No.
 ***************************************		******************************			
	00-00-00-00-00-00-00-00-00-00-00-00-00-		Free Service		

The face of the record card which is made out at the time the car is sold to the customer

						ge Servi	ce					
	CHART MG.	DATE	CARD NO.	CHART NO.	MILES	DATE	CARD NO.	CHART #0.	MILES	CARD NO.	CHART NO.	MILES
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The charge service is put on the back of this card

spection, are so systematically worked out that the time necessary to go over the car thoroughly is materially shortened, and it prevents any chance of anything being overlooked so long as the charts are closely followed.

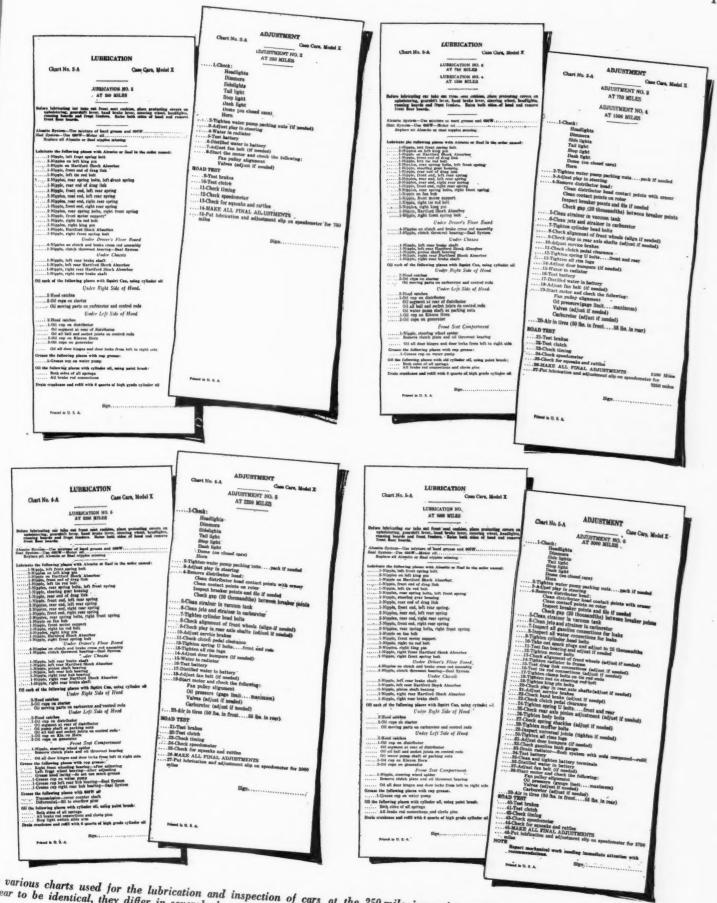
Notice to Owner

At the conclusion of this job, the 250 mile sticker, shown on these pages, is placed on the face of the speedometer. This notifies the owner to bring in his car at the end of 250 miles travel.

CASE Lubrication and Adjustment Service
At......Miles.

The sticker which is placed on the speedometer glass after each adjustment and lubrication operation

At the time of delivery complete information such as owner's name, address, date of purchase, license number, etc.,



The various charts used for the lubrication and inspection of cars at the 250-mile inspection and subsequent ones. While the charts appear to be identical, they differ in several places, to meet the varying needs of service as the mileage of the car increases. The inspection and lubrication services on these charts also are sold to owners of other makes of cars

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is filled in on the record card. This card also bears accurate information of car model, type, and body number as well as serial numbers of chassis, engine, battery, starter and generator.

The Car Record

On the face of this card space is provided for record of the date car is brought in for service, the repair card number, actual mileage at the time of service, etc., including any general remarks about the car. The face of this card is used for the free service.

A similar record of all work done on the car after the completion of the 3,000 mile free service period is kept on the reverse side of card, under the heading "Charge Service."

When the car is brought in at 250 miles, chart No. 2-A is used, on which are listed all of the operations to be gone through. In the adjustment chart it will be noticed that all lights are inspected. Any bulbs found burnt out are replaced. The battery is tested, radiator filled, etc. Thus every point is inspected and the owner is assured that the car is being looked over carefully. In all subsequent inspections these things are gone over.

At the completion of this job, the 750 mile sticker is placed on the speedometer. Following the 750 mile lubrication and inspection, the car is brought in every 750 miles. When the 3,000 mark is reached, chart No. 5-A applies which terminates the free service.

Selling the Service

At the conclusion of the 3,000 mile free service period a letter is written the owner advising him of the fact and informing him that the same service may be continued for a nominal but definite cost for another 3,000 miles.

For this period the charts are used in the following order, 2-A, 3-A, 4-A, and 5-A, and may be repeated in this order indefinitely for any term of service desired.

Visiting cars not under the regular service plan can be serviced by follow-

Mr. John Ira Jones,
428 Outside St.,

Los Angeles, Cal.

My dear Mr. Jones:

I am certain you will find the Case Model "X"

Sedan you have just purchased the most satisfactory car
you have ever owned. It is going to be my business to
help make it so, and I am looking forward to the opportunity
of being able to be of service to you.

If you are not familiar with our special service plan will you kindly read the booklet, "What Comes in the Years That Follow". You will find a copy of this booklet in an envelope in the right front pocket of your car.

You have noticed a sticker on the speedometer face reading, "Case Lubrication and Adjustment Service due at 250 Miles". This is your reminder to bring the car in when the speedometer shows 250 miles. This service takes between 3 and 4 hours.

Will you please give me a phone call the day before it is most convenient for you to bring in the car?

Sincerely.

Service Manager.

A sample of the type letter sent out by the service manager to the new car owner

when the 250 mile mark is reached. The service manager writes a letter to the owner just after the delivery of the car.

The fixed price of a 3,000 mile period of service can be set by the dealer according to local conditions. The follow-

SERVICE CHART PRICES

						Labor	Grease	Oil	Total	Charge
Lubrication	No.	3,	2 h	rs a	t \$1	1.25\$2.50	\$1.00	\$1.80	\$5.30	
Adjustment	No.	3.	31/2	hrs :	at s	\$1.50 5.25			5.25	
		-,	- /-							\$10.50
						Chart 4-A				
Lubrication	No.	5,	21/2	hrs	at	\$1.25\$3.15	\$1.00	\$1.80	\$5.90	
Adjustment	No.	5,	31/2	hrs.	at	\$1.50 5.25			5.25	
										\$11.00
						Chart 5-A				
Lubrication	No.	6,	2	hrs.	at	\$1.25\$2.50	\$1.00	\$1.80	\$5.30	
Adjustment	No.	6,	6	hrs.	at	\$1.50 9.00			9.00	
										\$14.00

ing the schedule given under Lubrication No. 5 shown on chart 4-A and Adjustment No. 6 shown on Chart 5-A.

The above includes 6 qts of oil in engine and oil and grease throughout each time car is serviced.

When a new car is delivered the owner is informed about this service plan and asked to bring his car in for inspection

ing schedule is being used by one dealer at which rate he is making profit:

At the end of the free service period the dealer makes an effort to sell the owner on this service plan so that he will continue with it. The service manager does a great deal toward selling the plan by writing the owner at this time a well prepared letter.

DOING ONE THING WELL

A MAN drove his car home one day just after the car had been washed at a service station. His wife asked him if they had done a good job and the man's answer was "Oh, pretty fair job." A casual inspection of the car seemed to show that the work had been done in a fairly satisfactory manner, but upon close inspection certain things stood out as indications that the man who washed the car did not do the job as well as he might have done.

Around the hood for instance, he had not lifted the hood and washed around the clasps. He had not raised the cowl ventilator and washed around it. The windows had not been lowered and the top edges washed. The result was that when the windows were lowered, there showed a smeary edge for a half inch

In short, this car washer should take a lesson from the housewife who, when she cleans a room moves all the furniture so she may be sure to get all the dust and dirt out of the room.

Putting on a Front

An Investment in Plate Glass and Steel Girders That Paid 75 Per Cent on the Investment in Increased Sales the First Eight Months

A gambler's chance, taken and won. No not that. A shrewd guess, a breadth of vision, a something seen, that most of us do not see. A confidence in the vision seen, and a determination to follow the hunch in spite of the prophets of gloom. Yes, that is it. The basis of a flourishing business.

Perhaps Sig Kjellgren had a vision of that sort before concrete had made the highways what they are today, for four or five years ago he started his tire and accessory store at the corner of 7th and Charles Sts. in Rockford, Ill. and by dint of hard work made it produce the wherewithal to keep the sheriff away and the kids in school. But families have a peculiar faculty these days. What was plenty last year, is far from sufficient today, and the family meal ticket must meet the needs as they develop.

Sig ran into this same problem that from time immemorial, if not before, has been the worry of mankind. He had his store, and it was a good store, but he wanted to make it sell more tires, more supplies, more of everything that motor car users buy. People around Rockford



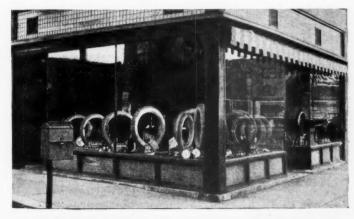
Sig. Kjellgren

liked Sig. There was of course the usual competition from the other fellows who also had to scare up the means of eating occasionally, and now and then a cut rate artist would start up, flourish for a while, and then light out, leaving a

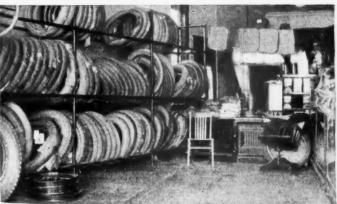
trail of business disintegration behind him. But in spite of all these things Sig was making good and getting his share of the Rockford trade.

The thing to do then was to go after the transients. You couldn't go out and sandbag them as they went by, the stone age stuff might do in theory, but in Rockford they might object. You couldn't stretch a rope across the street to make them stop, some other tie was needed. There was no alternative, the front of the store, the show window, all those things that could be seen at a glance must be made such that the car owner needing anything would say to himself, "Here is the place to get it."

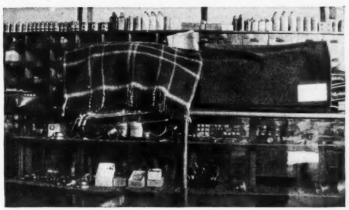
So Sig called up the National Mirror Works, doctors for sick and ailing business, and got their recommendations. It was a staggering dose, the treatment they recommended, but when Sig recovered from the first shock, he gritted his teeth and decided to go through with it. It wasn't just the cost of some plate glass that carried the bitter part of the dose, but before this could be done, the whole side of the building had to be shored







The silent salesman where the highways meet
The Tires are ready to make good on the invitation extended by the
front window



A full line of accessories supplement the sale of tires

Robes on display to boost the sales on the first cold days

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TIRES TO THE STATE OF THE STATE

It used to be "Just one of those stores"

Now it stands out as a merchandising center

up and steel girders installed to keep the overhead from falling down onto the front sidewalk.

Five thousand dollars was the penalty Sig had to pay for the privilege of living and doing business in the way he felt it should be done, and if there were some who doubted Sig's judgment, they are no more. The results have justified the change. In the first eight months of 1923 the sales have run ten thousand dollars higher than for the same period of the previous year, and the business had been fair before.

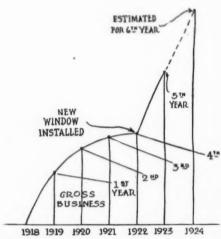
The curve which illustrates the growth of Sig's business however, tells the tale better than can mere words. The height of the lines for 1919, 1920 and the succeeding years represents the gross sales made, and it will be seen that in 1921 and 1922 the sales were the same, showing that the business had ceased to grow. Then the change in the front was made, and the sales made a sudden upward leap.

If this story were to end leaving the impression that a show window was the only requirement for a successful business, it would be a poor story indeed, for Sig's substantial business methods were the necessary foundation, before the window could do its part.

"Since starting five years ago," said

Sig, "we have never followed the common practice of selling low quality merchandise at cut prices. Our purpose has always been to get the best in the market, either tires or accessories, and to sell it at a price fair to the buyer, and at a fair profit to ourselves, without which it is impossible to continue doing business.

"We have had considerable competition



"The curve which illustrates the growth of Sig's business tells the tale"

on cut price, low quality tires, each year bringing new dealers with get rich quick ideas on how to sell tires, and in this connection we are not sorry to say that the average life of these concerns is about eighteen months.

"This year we are starting a list of names that is going to prove of great value. When a man buys a tire of us, we get his name and address, and put down the date and the size bought. This list proves very helpful when a tire is returned for adjustment, and also serves as a mailing list. Whenever a tire is brought back to us and appears to be defective, we have the customer fill out the regular claim forms and then give him an adjustment at once, taking our chances that we are right and that the tire company will stand back of us and adjust to us later.

"This makes it possible for the customer to get a tire for his car without waiting two or three weeks to hear what the factory is going to do about it, and we find that the good will engendered by handling the work this way makes it well worth while. In this way we try to live up to the promise of fair treatment and the cordial invitation extended to the passing motorist by our 'window salesman.'"

23 Years Ago This Week In Motor Age

(From Motor Age of Oct. 18, 1900.)

From Bicycles to Automobiles

BUFFALO, Oct. 15-Cycle row is fast losing its identity. The show windows of several of the salesrooms that have for years been resplendent with the different types of the cycle now contain displays of automobiles, while in others stoves and ranges, sewing machines, pianos and other wares are being as conspicuously displayed as was the bicycle. The Mobile company is showing a full line of its vehicles in the store formerly occupied by the Lozier sales department of the A. B. C. Cleveland bicycles still occupy a position on the floor and manager Robinson continues to hold forth in his old office, but how long this is to continue reports sayeth not. A fine display of the Kensington product has superseded the bicycle at H. C. Martin's. It is said that Mr. Martin will drop the cycle entirely and devote his attention in the future solely to the sale of the Kensington carriage.

Central Park Opens Up

NEW YORK, Oct. 13—It is understood that the park commissioners are considering rules and regulations for throwing open Central Park to the automobilers very shortly and thus heading off the fight in the courts that prominent motor vehicle owners are now organized to make to test their rights.

Advertising "Octupus"

NEW YORK, Oct. 13-The advertising

octupus has reached out its arms and gathered in the motor vehicle for publicity purposes. An automobile advertising company has begun operations here. It has large electric trucks with the sides raised to sign board dimensions. These sides are divided into sections, each of which carries an elaborately painted advertisement. The big car attracts much attention on its trip through the main thoroughfares and it is to be inferred that the signs thereon receive their share of notice.

Getting Congress to Act

WASHINGTON, Oct. 14—An effort will be made during the coming session of Congress to secure an appropriation of \$3,000 for the purchase of a motor ambulance for the police department. The superintendent has included this sum in his budget of estimates for the year and will make a personal effort to secure it.

Bill Fixit's Return

Spud Billings Has Yard's Old Car Fixed Up for Easy Starting and Bill Shows a Few Tricks in Testing and Overhauling Magnetos

By A. H. PACKER

Previous articles in this series were published Feb. 15, March 8, May 3, May 31, July 5, July 26, Aug. 16, Sept. 6 and Sept. 27, 1923

ILYARD DALTON had driven his Krankard speedster, until the glory of the Runwell line, as new sedan had led him to relegate the old bus to the discard. Discard as far as Yardy was concerned, but not to the junk pile, for it was still good for many miles, and Spud Billings who had bought it from Yardy was determined to collect those miles with the least possible expenditure of effort.

The starting system, one of the first that ever tempted the credulity of a good natured public, or baffled the efforts of the town electrician, was a wonder to behold. Wired like a plate of spaghetti it took all of Bill's genius to solve some of its trivial ailments, but its natural tendency to turn the engine over at an exasperatingly slow speed, was something no shop could correct.

With the battery fully charged, the engine warm, and the carbureter in an exceedingly good humor, the starter might be effectual in cranking the engine, but when all the conditions were not just right, the high tension magneto with which the job was equipped would not turn quite fast enough to produce a spark, and the answer was, "wind 'er up."

Spud had often talked to Bill about it and had considered using an impulse coupling, but after some persuasion had consented to have a battery system installed in addition to the high tension magneto, which with the T head engine would not only give easy starting but also a little more power when running at high speed.

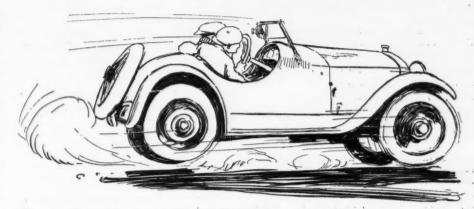
So it happened that at the regular shop conference the question came up as to how the battery ignition would be connected to the magneto, so that the spark would be advanced the same amount in each system.

Valvy Springs a Half Baked Idea

"You need the advance arms on both ignition outfits the same length, don't you?" said the Valve Grinding Fiend.

"That all depends," said Bill, "if you mean to have them turn the same amount when you advance the spark, you're wrong, and we better look into things a bit to see what we really do need.

"In an ordinary four cylinder engine, we have a power stroke in each cylinder every second revolution, so that a four cylinder engine has to turn over twice to have all cylinders fire. That means that for one revolution but two cylinders fire and we therefore need but two sparks per revolution. In the regulation magneto we have two points on the cam,



"It was still good for many miles and Spud Billings who had bought it from Yardy was determined to collect those miles."

and accordingly get two sparks each time the magneto makes a revolution.

"That's why a FOUR CYLINDER

MAGNETO TURNS AT ENGINE SPEED.

"With the battery ignition system however, we have the distributer arm on the same shaft with the cam which operates the interrupter, so that this shaft must turn at half engine speed so that, when it goes around once and produces four sparks, the crankshaft will have gone around twice so that the engine can use the four sparks produced.

"Suppose for example that at some speed we could use a ten degree advance, that is, the spark would occur ten degrees before the crank shaft turned to the point where the piston was at the top of its stroke. With the magneto, which turns at engine speed, this means that the advance arm which turns the interrupter housing should be moved ten degrees.

"With the battery ignition system however, it means that only a 5 degree movement is needed, for if one revolution on the battery ignition shaft is equal to two of the crankshaft, then 5 degrees of this shaft will be equivalent to 10 of the crankshaft, and in Fig. 1 we have a lay-

2"RADIUS
1"RADIUS
2"RADIUS
2"RADIUS
ROTATION
2"RADIUS
ROTATION
STREETING CALIMAN

Fig. 1—The spark rod construction should be such as to move the battery interrupter half as much as the magneto

out that shows one possible way of doing the job.

"Here we have one detail that Valvy suggested, a two inch radius on the advance arm of both the battery interrupter and the magneto, so we have to arrange some system of levers and rods that will move the battery interrupter only half as much as the magneto interrupter. One way of doing this is shown in the sketch. We have two little L shaped pieces known as bell cranks and the arms of these cranks shown vertical are connected with a rod, so that if one of these bell cranks is rotated, the other will have to rotate through the same angle.

"The arm of the one at the left however, which extends to the left, is twice the length of the one that extends to the right from the right hand bell crank. Then if the advance rod at the left moves one half inch it will, through the medium of the rods and bell cranks, move the rod to the battery interrupter only one quarter inch.

"Now," said Bill, "we want to make that job of Spud's as good as possible, so we want to make sure that besides putting on the battery system, that we check the magneto to see that it is giving the best possible results. The car is in running condition now, so there can not be anything seriously wrong with his magneto, but if a thorough test were to be made on any magneto we would have quite a number of things to check.

"On any machine it is usually well to make a preliminary test before starting any work. Otherwise you may do a lot that is unnecessary. On a high tension magneto a preliminary test is easy, for it can be turned quickly by hand to see if a spark jumps in the safety gap. This gap is provided so that the secondary winding insulation will not be strained in case the magneto is running and a wire falls off of a spark plug.

"On such a test it is usually found

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that the spark will not jump if the interrupter is retarded while, with the magneto in good condition, it will jump if the interrupter is advanced. This is due to the fact that the armature is not in such a position as to have the peak of the A. C. wave when the points open in the retard position, while it does catch the peak when in the advance position. On some types of magnetos however, there is not this difference for the magneto is designed to catch the peak of the wave regardless of the position of the advance lever.

"After a preliminary test and inspection, a thorough job would include taking the machine completely apart, and if no spark or a weak spark has been obtained on the preliminary test, then it would be advisable to test the armature, just as if it were a battery ignition coil.

Testing a High Tension Magneto Armature

"The magneto armature has for its foundation an iron core on which the two windings are wound; then it has a primary or coarse winding and a secondary or fine winding, so that it is quite similar to a battery ignition coil. This means we can test it with battery current to see if it will give a spark and in Fig. 2 the method of making this test is shown.

"When we come to figure the action of the condenser we find a peculiar condition, and here we must remember that THE CONDENSER MUST ALWAYS BE CONNECTED ACROSS THE CONTACTS. With the magneto in normal operation the primary winding sent current through the contacts only, and then through itself. The magneto condenser in the armature then, when being connected across the contacts, was at the same time connected in parallel with the primary.

"Then, when we remove the normal interrupter and connect either it or another interrupter in series with a battery and the primary winding of the magneto, we find that the regular condenser is not properly connected. It is across the primary instead of across the contacts that are now being used. In this position electrically it will have some effect in absorbing the kick of the primary winding but will not be effectual in taking care of the inductive kick of the leads used in making the connections.

"There are then two tests we can make on the armature, one without an extra condenser and one with it. Without an extra condenser, the armature should give a spark that will jump about three-sixteenths of an inch but it will be a rather thin blue spark without much red color or heat in it. With the extra condenser connected however, the spark will jump the gap more readily and will be hotter, fatter and redder.

Testing the Interrupter

"As the armature when on the bench is not connected to its regular safety gap, it is necessary to improvise one with a piece of stiff wire, by wrapping it around the shaft and bending it over toward the slip ring.

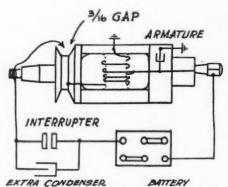


Fig. 2—Method of testing a high tension magneto armature with a battery, interrupter and a spare condenser

"Inspection will usually show up defects in an interrupter especially if the workman has had some experience with devices of the sort. On the points there is usually a layer of platinum which after long use may be burnt, filed or worn away, so that contact is really being made on the iron rather than on the platinum tip.

"To tell whether this is the case or not, it is well to use a magneto contact file and file around the sides of the contacts. This will clean up the surface so that the weld line between the platinum and the iron can be seen. It is then easy to tell whether any platinum is left and how much.

"To test the interrupter insulation, a 110 volt lamp line can be used with the points blocked open with paper or wood, and with a test point on each contact, the lamp should not light up.

Assembling the Magneto

"In putting the armature back in the magneto and putting the end brackets in place it is well to have the magnets off. There will then be no side pull on the armature, and in an overhaul job the magnets should be remagnetized anyway. A small amount of vaseline should be used on the bearings.

"In disassembling and reassembling a magneto care should be used to see that the ground brushes are not broken. Usually one of these can be removed from the bottom before the other parts of the job are undertaken. If it is suspected however, that there is a ground brush inside of the frame, making contact with the rotating armature, then the armature should be placed in a vertical position when withdrawn from the frame, so that the brush can not spring up into the coil space, and then be sheared off by the end plate of the armature as the armature is withdrawn.

Installing Interrupter

"The application of the interrupter is easy, BUT there is one mistake that is easy to make. If you are not very careful you will put it on so that the key does not go in the keyway in the shaft. Then the interrupter will wobble, and will not be timed right with respect to the armature position. The points will open at the wrong time and you will get no spark, or at best a very weak spark. In some magnetos there is a ground brush on the back plate of the interrupter, and this should be inspected when the interrupter is put in place to make sure that it is O. K.

Testing Distributer Cap

"Not frequently, but once in a while, the high tension current will puncture the insulation of the high tension brush holder, the pencil that carries the high tension current to the distributer, or even the distributer itself. It also happens sometimes that carbon from the distributer brush will cause the spark to jump from one segment to another until a burnt path has formed across which the spark can jump. As such conditions are caused by very high voltage, they can not be checked with the ordinary tests.

"For testing of this character a high voltage spark is needed, and an ordinary vibrating spark coil such as a Ford coil is quite suitable for this work. In Fig. 3 a scheme of using such a coil is shown. Battery current is allowed to flow through the primary of this testing coil so as to make it vibrate and produce sparks. Then the two ends of the secondary winding, for best results, are

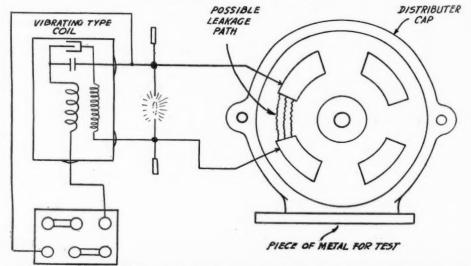


Fig. 3—Testing a distributer cap for high tension leakage, using a battery and a vibrating type ignition coil

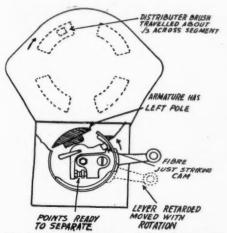


Fig. 4—Checking setting of distributer gear with interrupter lever in the advance position

connected to an adjustable spark gap. The voltage obtainable being limited by the setting of the gap, makes it possible to vary the severity of the test to be made.

"Now attach a couple of test wires to the terminals of the gap and connect them to adjacent segments of a distributer cap and set the adjustable gap at one quarter inch. The actual distance between the segments is about twice this or one half inch so that normally the spark would jump at the adjustable gap.

"However, if the insulation between the segments has been covered with carbon, so that sparks have jumped and burnt streaks in the insulation between the segments, it may be found that sparks will jump the longer distance in preference to the quarter inch gap in air. Under such circumstances cleaning the surface with sandpaper to remove the carbonized insulation will act as a fair repair, or if a light cut can be taken in a lathe it will be a more workmanlike job.

"Tests should be made in this way between pairs of segments, also between each outer segment and the center one, and from the lower segments to the base of the cap. In most magnetos the distributer cap sets on the end bracket of the magneto, and it is possible to have sparks jumping through to ground. When testing on the bench a piece of metal may be put where the magneto frame or end bracket would normally be so that a test may be made at this point.

"In similar manner the high tension brush holder and pencil may be tested with the vibrating ignition coil by using one of the leads at the center conductor and forming the other in a loop of wire which can be passed over the outer portion of the brush holder or pencil. If a defect is present it will be shown by sparks jumping through the insulation or over the surface.

Timing the Distributer Gear

"On most magnetos the timing of the distributer gear is indicated by means of punch marks or other symbols indicating which teeth should mesh. However, after a magneto has been built for several years and goes through the hands of mechanics that are not always sure

just what they are really trying to do, it may have accumulated a number of punch marks, so that it is difficult to tell which are the correct ones.

"It is accordingly advisable to check the setting of the distributer with reference to the armature and interrupter action as illustrated in Fig. 4 and Fig. 5, Fig. 4 showing a test to be made with the interrupter advanced, and Fig. 5 showing the check to be made in retard.

"Advancing the interrupter always means moving it against the normal direction of armature rotation. In that way the cam and fibre bumper meet sooner, so that the spark occurs sooner—that is, it is advanced with reference to the motion of the engine.

"Then the armature should be turned until the bumper and cam are just touching and the contacts are just ready to open, which gives the position where the spark will occur. At this same time the brush in the distributer should have just approached one of the segments and should be making a full contact with it. It is important that the brush should not have traveled across the segment any great distance. If it has it will still be 0. K. in the advance position but in the retard position may be off the segment.

"If you are sure of yourself on this advance position setting the other one is unnecessary but, until you really are sure, the timing of the gears should be checked in both positions. With the interrupter retarded the distributer brush position will be farther across, perhaps two-thirds of the way, or nearly ready to leave.

Installing the Magnets

"About the last thing to do to the magneto is to recharge the magnets and put them on. In most magnetos it does not

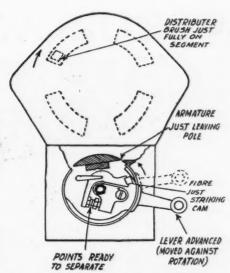


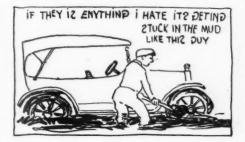
Fig. 5—Checking setting of distributer in retard position

make any particular difference whether the north poles are on one side or the other, just so all the north poles are on the same side. For this reason magnetizing is quite simple.

"Each magnet may be allowed to go on the magnetizer the way the attraction draws it. Then when transferred from the magnetizer to the magneto, a keeper should be used, and all magnets should be transferred in the same way so that the polarity will be right. The keeper should be applied to the magnet before it is taken off and should only be allowed to come as the magnet is slid onto the magneto. In this way the magnet stays at maximum strength for it is never without a keeper and, when on the magneto, the iron of the armature and field poles acts as a keeper.

DAN'S DIARY

OCT. 18—That trip wich me and my girl took last week was shure a swell ride us going over into Wisconsin about 50 or 60 miles and talk about roads. They dont no nothing about roads



around here.

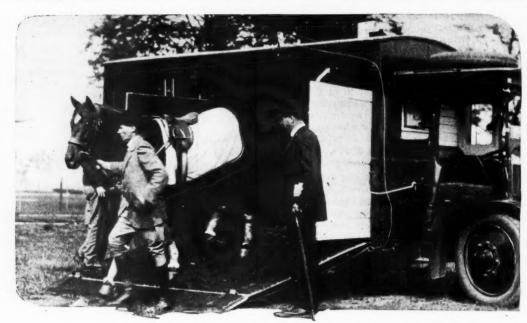
Everytime a guy wants to go somewhere around here he has to go single file on a concrete and if he gets ofen that he runs a good chanct of getting stuck in the mud or the works shook out of his car or eltse lost.

Them birds up in Wisconsin was telling me it only costs \$250 bucks a mile

to keep them gravel roads of theirn in good shape a year wich includes grading and material. Gosh! 1 would much rather have about 140 miles of gravel for 10 years than only 10 miles of concrete for 10 years and that dont pay for taking care of the concrete either wich costs quite a lot becuz they gets a rut on each side wich has to be filled up. If them politishuns would stop trading concrete roads for their crooked deals and build a lot of good gravel roads going every where like Wisconsin has done it would be a lot better for the traveling publick.

And when it comes to marking them roads a guy wich was blind in one eye and near sited in the other couldent get lost in Wisconsin. They aint swell metal sines wich costs the peeple about 10 bucks apeece neether but are painted on telegraph posts and stones and culvert walls and fences which is always handy and the 10 bucks will keep about 50 of them painted new every year cuz they are just stensiled and a guy can do a lot of them in a day.

MOTOR AGE'S PICTURE PAGES



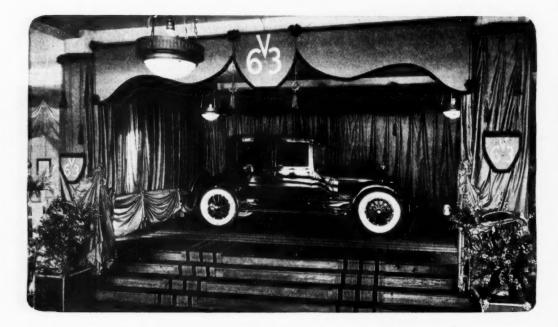
Papyrus, winner of the British Derby, is the possessor of a specially constructed car of his own. He may be seen here leaving his "van," as the English call it, at Belmont Park, before the big race

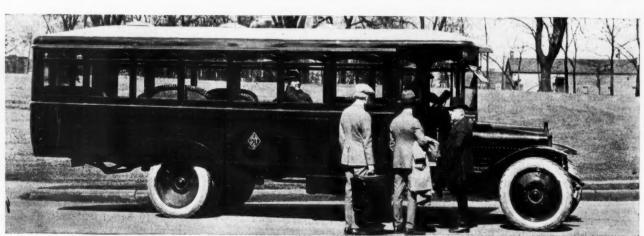
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& & B

Preceding the first day of display of the new V-63 model Cadillac, by the Cadillac Co. of St. Louis, a large sign, bearing a large question mark, covered the window. At the appointed time the window was opened and the new model displayed on a pedestal draped in purple and gold. The entire room was decorated in honor of the occasion





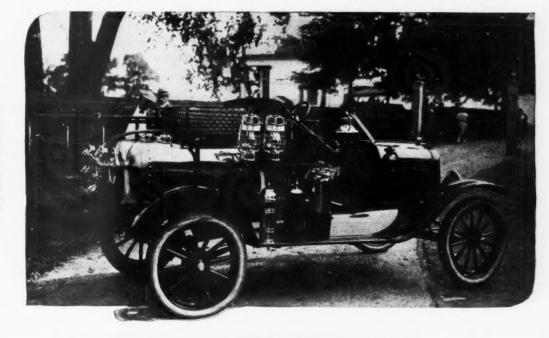


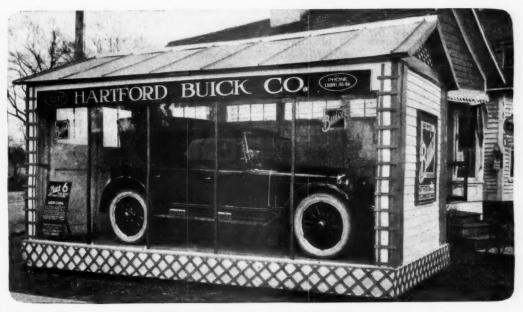
A motor buss chair car service has been established between Youngstown, Salem and East Palestine, Ohio. The four busses are mounted on White model 50 chassis and are entirely of steel construction. A two-hour service is maintained daily

OF AUTOMOTIVE INTEREST

Se 1 38

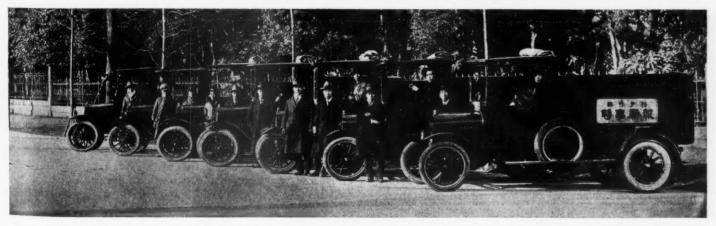
When Henry Ford visited Mt. Vernon, he saw no sign of fire protection for the home of George Washington, and so presented the reservation with one of his motor fire cars. Though concealed in out buildings, fire protection had already been provided so the new car will be used in case of fire on the outskirts of the grounds





Se se se

Portable salesrooms, placed at advantageous points where there are no other car displays, have been found effective by the Hartford Buick Co. Each is large enough for one car with ample space for inspection by prospects, and the cars are changed at least once a week



These seven Ford trucks were operated, previous to the recent disaster, by two Japanese boys, graduates of the Michigan State Automobile School. The owners held a contract with the Jiji Shimpo, a Tokio daily paper, by which they received 4,300 yen (\$2,150) a month for delivery service



Vol. XLIV

Thursday, October 18, 1923

No. 16

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Subscription Rates

United States, Mexico and U. S. Possessions ... \$3.00 per year 5.00 per year Canada
All Other Countries in Postal Union... ... 6.00 per year35 cents Subscriptions accepted only from the Automotive Trade

Entered as second-class matter September 19, 1899, at the post-office at Chicago, Ill., under the Act of March 3, 1879.

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Member of the Audit Bureau of Circulations

Member, Associated Business Papers, Inc.

THE CLASS JOURNAL COMPANY

Mallers Building, 5 South Wabash Avenue, Chicago

Horace M. Swetland, President E. M. Corey, Treasurer A. B. Swetland, General Manager Julian Chase, Directing Editor

Owned by United Publishers Corporation, 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; A. C. Pearson, Treasurer; Fritz J. Frank, Secretary.

Super-Chargers on Engines

7 HILE there is no immediate prospect of fitting super-chargers to the engines used in commercial passenger vehicles, there is, nevertheless, considerable comment on the performance of super-chargers fitted to racing engines.

In the recent European Grand Prix Race which was won by Fiat, entire credit for the victory is given to the super-charger fitted to the Fiat engines. It is quite certain that the foreign cars and at least one American car which will participate in next year's Indianapolis race will be fitted with super-charged engines. It is believed by many that a small engine fitted with a super-charger is more satisfactory than a larger engine running at atmospheric pressure.

A super-charger makes possible a reduction in the size of an engine and thus gets away from all disadvantages attending a big engine such as weight, larger oil consumption, cooling difficulties, vibration, etc. The device itself is simple although its application to automobiles has proved to be a rather difficult task. It adds considerably to the power of an engine and has worked out satisfactorily under the most strenuous conditions of racing.

Several European firms are against the use of superchargers for racing. Their main objection being that forced induction is equivalent to increasing the size of the engine. Those who favor the super-charger point out that the device necessarily must be driven from the engine and is not, therefore, an additional unit.

"Do not build up your reputation at the front door and tear it down at the back door."

28 E 38

Traffic

RAFFIC and parking conditions are so universally bad that they have become a considerable sales resistance and we do not see any relief until some one with a strong interest and a constructive mind takes hold of the situation. Both of these qualities, we believe, rest almost entirely with the automotive industry, if you will allow us to include fleet operatives in this industry.

In a good many cities, as we previously have stated, the police have been made the goat of the situation. These problems are not police problems but are business problems. It is not right to expect a policeman to be a guardian of the public's business as well as its public conduct.

If the automotive dealers of any community will get together and nominate a traffic board, consisting of automotive dealers and heavy users of automotive vehicles and offer this board to the police department in an advisory capacity, they will probably get some action. Many cities have traffic boards, but in the main they are made up of persons who use but one automobile and that one is a personal vehicle.

The remedy will come in a large measure in the restrictions the large users of automotive vehicles will place on their own activities, but which they would oppose if some one else will suggest it. Also a group of such business men could do much by suggesting rerouting of automobile routes to clear certain corners. If the street car man is on this committee, he will probably offer some rerouting that will help.

Also a group of such men could easily convince some man with a bit of idle capital that a good parking lot or a day garage would be a good business enterprise.

Such suggestions will come only from business men and the problem has become too great a one to expect the police to handle it without aid. Give them your help and thought.

Already it has been made an automotive Christmasget in line.

What One Woman Thinks

NE swallow does not make a summer, nor does one opinion prove that a selling campaign is wrong, but one opinion sometimes points the way.

A group of automobile students was interested in an unusual and attractive car display in a very handsome salesroom. The cars were many colors and the paint jobs appeared to be excellent. It was quite a Dolly Varden effect and was especially startling because the line of cars sold by this company are known for the conservativeness of color designs. Obviously these cars were not direct factory products but had been stopped, on the way to the salesroom, in a paint shop.

Many people were passing and looking. The comments

were as a rule complimentary. Several observers remarked "Why these are like——cars," naming a line that plays freely with color.

Then came the woman who made the startling remark. She looked quite a while, noted the marks that identified

the cars and then said:

"I thought this was a new car place. These must be all old cars, for this factory only turns out black and blue cars, not these bright colored ones."

Perhaps this woman's opinion was an isolated one, but it made the automobile men who heard the remark think.

Se Se SE

If you are not prepared to supply the winter needs of your owners, it is time to get busy.

26 2 %

Used Cars

A NEW factor came into the used car situation the other day when Percy Chamberlain Associates, Inc., announced an organization to establish Appleby used car markets and to assume at least a partial responsibility for the continued operation of these markets.

The plan in itself is not greatly different, in its purely local operation, from some other central bureau plans. The added feature is the organization to back it up, supply fresh ideas and to keep the members of the local bureau sold on its workings.

This plan appears to have been accepted by more towns on the west coast within the last year than any other plan in other sections of the country, as is to be expected when the proper force is put behind it. No other plan has had a definite effort behind it. Each has been devised for some community and its spread has been due solely to local effort to get it.

We will repeat here, as we have said many times before, all of these plans are fundamentally wrong in that they take out of the automobile dealers's control a part of his business which should be profitable to him. That is the theory.

The practice is that very few dealers are making money on their used cars and they will not until they have been educated to see that there are the same possibilities for profit in used cars that exist in new cars. The slipup today comes in the fact that the automobile dealer is not well trained in buying, as other merchants are.

The automobile dealer buys of only one source and making the wholesale price of the car he sells is entirely out of his hands. In this, he is unlike the dry goods merchant who has several offers of practically the same goods from different sources and in order to thrive, he must train himself in buying in a competitive market.

Some day the automotive merchant will train himself as a buyer in a competitive used car market and then he will be able to buy his used merchandise at the proper price. But he must be educated to this standard and the benefit of these plans, as we see it, is that they are an educational means. It might also be educational to let the car dealer go on buying and losing money until he learns, but experience has shown that he learns very slowly. The fact is that he does not keep his records right and so the lesson does not come home.

Recently the retail car salesman of a dealer in a small city sent a car to the used car manager for an

estimate. The price given was \$530. The retail car salesman begged for a larger allowance, but the used 'car manager was firm. His final answer was:

"It is nothing to me what you give this owner for his car. Go the limit, only, when it rolls into my department, I will credit your department with \$530 and not another cent. If I do not make money in my department, I do not get paid. So I must play safe. If you want to boost this price and charge the loss to your own department and settle with the boss, all right and good."

The retail salesmanager looked at his own profit sheet and decided not to charge himself with a loss but to redouble his effort to make the sale on the allowance. Under the old rule, this loss would have been charged to used cars.

The only way some merchants will ever learn what a real sales profit means is to get themselves in a position where they cannot give the profits away and charge it to something else. All of the central bureau plans do that.

We believe that the Appleby plan conducted under supervision has added advantages over the isolated or independent bureaus. We cannot doubt that every effort will be put into this follow up encouragement. Percy Chamberlain's reputation must be good for some faith in his efforts.

"The dealer who has the best chance is the man who has a good product, a real organization and liquid assets—not assets tied up in the used car basement.

第幕器

Association Work

AMAN who pays attention to such things recently said that there were more leeches working on the automotive dealer industry than any other industry in this country.

This man referred to fake collection agencies, legal advisers, co-operative advertising schemes, chain sign plans and what not.

It would appear to any one concerned with the correspondence that comes to Motor Age that this must be true. We hear of many fake concerns that work with the objective of the automotive dealer's pocketbook and usually we hear of them after they have collected. Of course, we hear of only a part of them.

The very wonderful service that some of these companies offer should arouse suspicion on the very face of the first circular. No man can do some of the feats these circulars offer to do. Any automotive merchant receiving one of these circulars should investigate the wonderful claims before he pays well earned money.

Such investigations as these fit well into association work. Your local, state or the national association always should be glad to make inquiries. Indeed, some of them are making such inquiries frequently and the N. A. D. A., for instance, has built up quite a file of exposes of such concerns and this information is available to the local associations on inquiry.

There is no question but that if the dealers who receive these offers to perform wonderful service would refer them to the association manager before paying his bit, that the association would save him a considerable sum.

We do not mean to say here that none of this sort of agencies are worth while, but we do mean to say that a good many of them are not and the good ones will welcome any effort at investigation.

Sales Level Well Maintained

Tapering Off in Production Likely for Next Few Months

Increase of Output Expected to Follow Soon After First of the New Year

NEW YORK, Oct. 15—Although sales of automobiles have fallen off in many sections of the country, with a consequent reduction in manufacturing schedules, there is no question but that business is far better than it was a year ago at this time. The drop in sales is by no means exceptional to the period and is not severe enough to cause any concern.

Reports from sales centers indicate that the volume of business is up to expectations, though not carrying along on previously established high levels. Buying is following much along the same conservative line that is governing output.

If manufacturing operations follow the curve of last year there will be a tapering off from now until the beginning of the year when a quickening will take place. This latter condition is certain, due to the stimulus given by the New York show, to be held that month. January of this year saw the start of expanded operations that continued through the nine months, established new monthly output records and brought total production of cars and trucks for the three-quarters past the 3,000,000 mark.

Steel producers are reflecting the normal slowing down in automotive production, reporting a slight shading in orders and little difficulty in making deliveries. Parts bookings are being maintained at a satisfactory level, pointing to steady and, in instances, capacity operations.

Deliveries of finished cars are being made with greater promptness. Dealers in Detroit, the center of the industry, are now able to promise immediate deliveries, whereas heretofore orders have been taken on a 30 to 60 days basis. This is true in most parts of the country although some reports are received of tardiness in the receipt of closed models which has acted as a sales resistant. This, however, is merely a temporary condition.

In the tire branch of the industry, activity is not so pronounced as it has been although August figures from the larger makers show a movement forward in production and shipments as compared with July, and a decline in inventories. Shipments doubtless will be expedited and schedules stepped up under the impetus of a current report that an increase in prices is imminent and that manufacturers who recently made reductions will take steps toward restoring

Truck business is showing some improvement, with producers pursuing more aggressively bus manufacture.

More pronounced interest is evident in this medium of transportation rail

lists somewhat nearer their old position.

this medium of transportation, rail operators manifesting a greater inclination to adopt busses as adjuncts to their systems. Manufacturers report many developments in bus construction that will meet current needs and look more into the demands of the future.

Tire Dealers Move for Paid Service

ST. LOUIS, Oct. 15.—Tire dealers in St. Louis plan to replace free road service with paid service. Paid service was the aim of the St. Louis Tire Dealers Association which was organized in 1920 but which passed out of existence after it failed to introduce the plan because of the entrance into the field of dealers who advertised free road service. Two tire dealers are to make a tour of southwestern cities to study plans of road service.

One dealer said it was the plan to deliver new merchandise free and to give service at dealers' establishments free, but to charge \$1 for road service.

BIDS \$1,200,000 FOR TEMPLAR

CLEVELAND, Oct. 15—The Templar Motor Car Co., recently organized to manufacture the Templar automobile, bid approximately \$1,200,000 for the plant, equipment and accounts receivable of the Templar Motors Co. at the recent receiver's sale. Only one bid was filed. The bid provides for payment of taxes now due of \$42,415 and the bidders agree to pay the 1923 taxes as well as the franchise tax.

The Templar property has been appraised at around \$1,550,000. T. L. Hausmann, former receiver of the Templar Motors Co., is president of the Templar Motor Car Co., and Joseph G. Fogg of Calfee, Fogg & White, attorneys, is the present receiver for the Templar Motors Co. No date has been set when the court will act on the sale.

STEPHENS MAKING PROGRESS

FREEPORT, Ill., Oct. 15.—Organization of the Stephens Motor Car Co., Inc., independent of the Moline Plow interests, to carry on the production and sale of the Stephens car is progressing, according to an announcement by officials. The company will have a capitalization of \$2,000,000 common stock. Its total assets are listed by the officials at \$3,800,000 and its current indebtedness at \$1,000,000. The 1924 line of passenger cars now in production includes three enclosed models.

Dealers Hold Meetings for Salesmen and Shop Men

Monthly Gatherings of Kalamazoo Association Appreciated by Employes

KALAMAZOO, Mich., Oct. 13.—The Kalamazoo Automobile Trade Association has resumed the monthly mass meetings to which salesmen and shopmen are invited. The first meeting for this season was held at the Burdick Hotel cafe Monday night and was attended by more than 150.

The Kalamazoo association was reorganized about a year ago on the selective membership plan. Fifteen dealers have qualified for membership. Previous to that time the association here was only a show organization and did nothing to elevate the ethics of the automotive dealer business.

Under the present plan weekly luncheon meetings are held which are attended by one representative of each member firm. These meetings were well attended last year and the attendance since Labor Day when the meetings were resumed has been almost 100 per cent. Trade ethics and complaints are discussed at these weekly meetings and information is freely exchanged.

Last year two of the monthly meetings were held, featuring educational pictures and talks. The "Ask 'em to Buy" and "Shop Profits" films were used at one of these meeting and the members say these pictures had a very distinct influence for good.

This year the meetings have been resumed and very hearty applause greeted the announcement made that it was planned to hold one a month during the year, if the employes appeared to be interested.

The speakers Monday night were Thomas O'Brien, assistant sales manager of the Olds Motor Works, on "Sales Vitamins," and Clyde Jennings, editor of MOTOR AGE, on "Relation of Service to Sales."

The officers of the Kalamazoo association are: Howard Cooper, Dodge, president; Harry B. Parker, Maxwell-Chalmers, vice president; Otis H. Boylan, Reo, secretary. The association is planning a series of advertisements to be run in local daily papers building up the prestige of the association members.

GENERAL MOTORS MARK

NEW YORK, Oct. 13.—Hereafter all cars manufactured by the various units of the General Motors Corp. will carry a distinctive scroll or ribbon under the nameplate reading, "Product of General Motors."

Dealers to Discuss Consumer's List

Rubber Association Would Change Spring Dating Plan

Suggests Large City Dealers Should Buy Tires on Shorter Terms

NEW YORK, Oct. 13.-Five recommendations for revision of spring dating practice are made by the executive committee of the Rubber Association of America, Inc., in a letter addressed to members and dated Oct. 2. The recommendations advocate restriction of spring dating orders to the period between Oct. 15 and Feb. 28, solicitation of but one spring dating order from each customer to prevent overloading of dealers; continuation of the present protection against price cuts on spring dating business up to May 15; efforts to get business from city dealers on short terms: and application of spring dating terms in accordance with a zoning system which is outlined in detail.

Some individual members of the association believe, that the recommendations do not go far enough and that spring dating should be abolished entirely; but practically all of them seem to agree that the policies advocated by the executive committee constitute a definite step in the right direction. There is a feeling in some parts of the industry that these recommendations mark the first move toward elimination of spring dating at some time in the future, although nothing in the letter of the executive committee points definitely to such a conclusion.

While it is generally agreed that widespread adoption of these policies would be for the good of the industry, certain executives when asked for their opinion, emphasized the fact that the value of the recommendations depends largely upon how fully they are carried out by all of the important tire companies.

It was the unanimous recommendation that on account of the ample and constant service available to dealers in cities, also because of public demand during the Fall and Winter season being very little below the Summer period, every effort should be made to solicit business in cities on much shorter terms than are extended in other territory.

In view of the widely different climatic conditions existing in different parts of the country it was the view of the executive committee that it is unsound and unfair to apply the same spring dating terms to all alike. Accordingly, it was further recommended that the country be zoned with the recommended dates of shipment and payment for each zone as follows:

Florida Zone.—Soliciting of business to commence Oct. 5. Make shipments

after Oct. 15. Payment due Feb. 10, or January, February and March.

Southern Zone.—(Southern border or coast states outside of Florida, including California.) Shipments after Oct. 15. Payment due April 10, or March, April and May.

Middle Zone.—(Everything north of Southern Zone up to Northern Zone—middle section of the country.) Shipments after Oct. 15. Payment due May 10, or April, May and June.

Northern Zone.—(Line drawn from lower part of Maine through Minneapolis to Montana western border.) Shipments after Feb. 1, payment June 10, or May, June and July.

TWO DORRIS PROPOSITIONS

ST. LOUIS, Oct. 13.—There were two propositions put before the meeting of the stockholders of the Dorris Motor Car Co., held here on Oct. 5. One provided for the refinancing of the organization and the other for an outright purchase by outside parties. An adjournment was taken until Nov. 2 to give the stockholders a chance to think the matter over and to await further developments.

No action was taken with regard to the proposed merger with the Haynes and and Winton Companies and this situation remains as before.

SHOW AT UTAH FAIR

SALT LAKE CITY, Utah, Oct. 13—For the first time an automobile show was held in connection with the annual Utah State Fair which closed last week. The show was held in the building which in former years housed the horse show. The Utah Automotive Trades held its annual banquet during show week and the principal speaker was Edward S. Jordan, president of the Jordan Motor Car Co.

JAPAN BUYS 1000 FORDS

YORK, Pa., Oct. 13—Fredrick M. Small, president of the Martin-Parry Corp., announced today the receipt of orders by his company for 1000 commercial bodies to be shipped with Ford chassis direct to Japan within the next 30 days. It is understood that this is part of the program fostered by Japanese authorities for the rapid reconstruction of the Japanese cities destroyed by the earthquake.

MERCER RECEIVERSHIP ENDED

NEWARK, N. J., Oct. 13—The temporary receivership of the Mercer Motors Co. of Trenton has terminated, and W. A. Smith, one of the receivers, has been appointed trustee for the company. Smith also has been appointed general manager of the Newark-Flint Co., distributors of Flint, Locomobile and Princeton cars for the State of New Jersey.

N. T. D. A. Invites All Tire Dealers to New York Session

Elimination of Consumers' Price List One of the Subjects to Be Discussed

NEW YORK, Oct. 13—In the call sent out for the annual convention of the National Tire Dealers' Association, to be held at the Pennsylvania Hotel in this city, Nov. 13-15. President George J. Burger has broadened the scope of the meeting by extending an invitation to all tire dealers, regardless of whether they are members of the association, to attend because the questions and problems to be discussed are of interest to everyone in the industry.

"One of the important points dealers are interested in expressing themselves on is the elimination of the consumer's price list, distributed by manufacturers," says President Burger.

"At previous N. T. D. A. conventions this subject has been considered but there always has been a difference of opinion as to whether the price situation would be improved by the discontinuance of the list. Some dealers hold that the list only served as a basis for discount and demoralized the price situation rather than stabilized it. Others contended that it established a standard of tire value. In view of several manufacturers withdrawing their lists recently, this subject should develop some interesting discussions.

"Spring dating is another subject. Again the dealers hold different views, those in certain sections declaring that it is necessary if they are expected to carry stocks over the dull months in expection of the opening of the selling season. Among manufacturers the feeling is expressed that spring dating can be continued without detrimental effects to the dealer or the manufacturer, if it is properly handled and not taken advantage of as the means of overstocking the retailers.

"With the addition by some of the large companies of several lines of tires permitting them to offer a casing in three price classification, it is expected that an effort will be made to have dealers handle all three grades of tires to obtain the company franchise. Those who have followed this development say that it is the answer of the large companies to the complaint of the dealer that he was compelled to stock a cheap tire in order to meet competition. Now that the standard manufacturers can offer a casing for every price requirement, it is expected that they will object to the practice followed by the dealer in the past in handling the first line of the standard company as a lead to the sale of other makes of tires at lower prices."

Chicago Dealers Pleased With Their Closed Car Show

Fair Attendance Marks Opening Day Despite Stormy Weather

CHICAGO, Oct. 13—Chicago dealers were quite well pleased tonight when the doors were closed on the first day of their first annual closed car show under the auspices of the Chicago Automobile Trade Association.

The attendance had not been heavy, but there had been a steady stream of visitors through doors from opening time on. The crowd was not the usual free ticket crowd, as there was a considerable proportion of the visitors who paid admission. It developed that a number of the dealers who had been supplied with free tickets for the opening day did not give them to prospects, but gave them to shop men and employes.

The day was rainy and very gloomy, following two weeks of fine Indian Summer weather. The dealers were not at all downcast over this prospect, as they believed that it meant that many people who might be driving in the country in open cars would instead risk driving to the Coliseum and then might be in a mood to even more seriously consider a closed car deal.

The greatest anxiety of the exhibitors is apparently what they would do with the orders, as a good many of them are behind in closed cars orders already.

There are 52 makes of cars exhibited and these comfortably filled the main floor of the Coliseum and Annex. Half a dozen more exhibitors might be crowded in, but it is a more agreeable show as it is. Space Manager Fest reported that he had turned down at least a dozen applicants for space recently. Just previous to the drawing, he had offered space to every line of cars represented in Chicago, he said, and no effort was made to accommodate those who declined the invitation at that time.

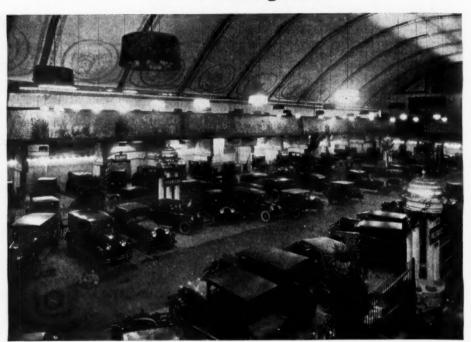
The Coliseum was brightly and cleanly decorated, the scheme being very similar to the classic designs used for the last National Car show.

Some disappointment is expressed by exhibitors that there are not more brightly painted cars on exhibition. There is a Franklin, with a canary yellow body and fabric top that is one of the bright spots of the show. There are other specially painted cars but they are not bright—at least not unsaleably so.

Dodge is exhibiting two cars with colors sufficiently bright to attract attention to an exhibit that is so habitually sombre. Of the four cars in the Hudson-Essex exhibit, three are specially painted.

Two Stars in maroon attract considerable attention. But in the main, the show is not as bright as a good many exhibits on dealers' floors, as Chicago dealers have been running pretty heavily to specially painted cars.

View of Chicago Show



Several of the exhibitors reported sales during the first session and while none insisted that they were entirely surprise sales, they did insist that they were not staged for the show.

While many of the models displayed are new to the Chicago public there are none that have not been described in MOTOR AGE either as they were announced or in the descriptions of the cars on display at the New York Closed Car show.

Harry P. Branstetter, chairman of the show committee, was among the absentees. After he had well completed the preparatory work, he was called to Denver by serious illness of his mother. Her illness resulted fatally and tonight a number of the dealers deserted the show to take a floral piece to the sta-

tion as Mr. Branstetter passed through the city, taking his mother back to the family home for burial.

Dealers exhibited cars as follows: Columbia, Apperson, Durant and Star, Paige and Jewett, Kissel, Cadillac, Chevrolet, Jordan, Cole, Velie, Cunningham, Dodge, Davis, Duesenberg, Auburn and Gardner, Oldsmobile, Franklin, Dort and Stephens, H. C. S., Chandler and Cleveland, Hudson and Essex, Buick, Rickenbacker, Marmon and Hupmobile, Maxwell and Chalmers, Oakland, Stanley Steamer, Overland and Willys-Knight, Packard, Pierce-Arrow, Peerless, Moon, R. & V. Knight, Elcar, Reo, Rolls Royce, Westcott, Gray, Case, Studebaker, Haynes and Winton, Nash, Stearns Knight and Lafayette, Wills Sainte Claire.

Accessory Show Management Reduces Price for Space

CHICAGO, Oct. 15—Coincident with the announcement of radical reduction in the price of space for the automobile accessory show being promoted for the Armory, Nov. 12 to 17, Robert M. Jones, manager, states that 80 reservations for space have been received.

The new prices are \$100 for an 8 by 10 ft. space and \$125 for 10 by 12 ft. space. The old prices were \$200 and \$300, respectively. Jones stated that the show management felt it was much better to have the Armory filled at the lower price than half filled at the higher price. About 200 spaces are available.

The management, Jones said, will provide the lettering of booth signs and will publish a booklet containing the names and addresses of exhibiting manufacturers, locations of booths, description of merchandise displayed and other information. It is proposed to keep the

show open daily from 9:30 a.m. to 9 p.m. and to admit dealers, jobbers and the public.

FORD'S WEEKLY PRODUCTION

DETROIT, Oct. 13.—Ford production figures for the week ending Oct. 9 show no reduction from the capacity operation at which the plant has been operating over the entire 1923 period. Cars and trucks for domestic sale for the week totaled 40,792, Fordson tractor 1,906, and Lincoln output 186.

GMC ONE-TON TRUCK

DETROIT, Oct. 13.—General Motors Truck Co. is now in production of its one-ton model with a 150 in. wheel base, which is priced at \$275 above the list on the standard one-ton model.

The state platform body which has been added to the one-ton express body line is listed at \$140 painted in the standard deep green.

N. A. D. A. to Hold District Meet, Dec. 10 at St. Louis

All Automotive Dealers in St. Louis Territory to Be Invited

ST. LOUIS, Oct. 15.—Local members of the National Automobile Dealers' Association met last week at the farm of F. W. A. Vesper and formulated plans for the holding of a district convention in St. Louis on Dec. 10. A committee consisting of E. A. Hatfield of the Mississippi Valley Motor Co., F. C. McDonald, Southwest Nash, and R. C. Frampton of Hudson-Frampton, was appointed to enlist the co-operation of the St. Louis Automobile Dealers' Association in the meeting.

Robert E. Lee, secretary of the St. Louis A. D. A., is now at work gathering the names of all dealers in this territory working under St. Louis distributors with a view to extending invitations to them to attend. It is planned to have speakers for various phases of the automobile merchandising business address the convention and to entertain the entire assembly at lunch. In the evening distributors will be free to gather the members of their own flock for any meetings or entertainment they may care to provide.

It is expected that between two and three thousand dealers from the St. Louis zone will attend.

Kansas City Battery Men Form Trade Organization

KANSAS CITY, Oct. 15—An association of battery men is being organized in Kansas City. The first meeting was held the night of Oct. 10, with an attendance of 65. This initial attendance was developed by hard personal work by W. P. Ryan, president, and B. E. Bauer, manager, of the Midland Battery & Equipment Co., who made personal calls, sent out two letters, and called by telephone. There are 110 battery retailers in Greater Kansas City, and of these, it is expected that the association will embrace 100.

The distributors and jobbers of batteries and supplies are giving support and financial help. George M. Husser, secretary of the Better Business Bureau of the Kansas City Advertising Club, assisted in this organization, and was made temporary chairman, to continue at the head for a few weeks until permanent organization plans are perfected. Husser's participation is due to one of the prime objects of the association, which is to correct improper and misleading battery and battery service advertising, both by factories and by retail firms.

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The association will employ a secretary, outside the battery business. The new body has been helped by the Motor Car Dealers' Association, and by the Garage Owners' Association.

20,000 See Detroit's Closed Car Show



DETROIT, Oct. 13—Detroit's closed car show was brought to a close tonight drawing an attendance of approximately 20,000 during the week. As an advertising feature for dealers the show was declared a success, and the attendance ran well ahead of former closed car shows.

Sales at the show were not heavy, as the closed car market has been caught up to, to a large extent, and there is not the turnover of open cars to closed ones as in former years. Furthermore closed car buying has had a large part in the heavy volume of business during the year, outstripping open models in this respect. The show this year reflected the attitude that patrons were attending more to see the new models in all lines, rather than because of any special closed car interest.

There was a scattering of buying in practically all lines, but the largest volume was reported in the \$1,500 to \$2,000 price class.

FLINT FACTORY IN OPERATION

FLINT, Mich., Oct. 13—Production has started on the Flint Six in its new plant in this city, the first car being turned out Oct. 1 by the Flint Motor Co. Heretofore the Flint has been made at the Long Island City factory which will continue to supply the Eastern demand, while the Western marketing will be under the control of the Flint office here. Eastern distribution will be handled through the Locomobile Co. of America.

DEALERS TO SELL YELLOW TRUCKS

CHICAGO, Oct. 13—The Yellow Cab Mfg. Co. announces that its new one-ton truck, the Yellow Cab Express, will be marketed through distributors. This is a departure from the company's method of selling taxicabs which is direct through its own traveling sales representatives

GIVE UP CLOSED CAR WEEK

INDIANAPOLIS, Oct. 12—The directors of the Indianapolis Automobile Trade Association met today noon and after reconsidering the plan agreed upon last week for the holding of a Closed Car Week with displays in the dealers' show-rooms and considering the possibility of holding a regular closed car show decided not to do anything along this line at this time. Many of the dealers have not yet received supplies of the closed types their factories are to produce this

fall, and it was thought inadvisable to have a show or a Closed Car Week under association auspices with so many dealers at a disadvantage.

STUDEBAKER'S 71 YEARS

SOUTH BEND, Ind., Oct. 13.—The Studebaker Corporation this week celebrated its seventy-first anniversary as a manufacturer of vehicles. Employes of the company and their friends assembled in Springbrook Park where medals were presented to 1,470 employes in recognition of continuous service for periods of 5 to 20 years and more.

Gold medals were given those who had been with the company 20 or more years, silver medals for 15 to 20 years of service and bronze medals for 5 to 15 years. Quite an event was made of the presentation of a gold medal to Adolph Wolters who has been a Studebaker employe for 51 years and is still active at his job. His medal was handed to him, in front of the entire gathering, by A. R. Erskine, president of the company.

FRANKLIN SHIPMENTS DOUBLE

SYRACUSE, N. Y., Oct. 15.—"During the past 30 days our shipments have more than doubled," states H. H. Franklin, president of the Franklin Automobile Co. "Early October business shows a substantial increase over the corresponding period in September."

Coolidge Hears Aims and Hopes of Automotive Industry

Committee of N. A. C. C., Headed by Roy D. Chapin Calls at White House

WASHINGTON, Oct. 13.—An advisory committee appointed by the National Automobile Chamber of Commerce to co-operate with the Department of Commerce came to Washington last week and definitely presented the aims, objects and methods of the automotive industry to President Coolidge and members of his cabinet.

The committee consists of Roy D. Chapin, Hudson-Essex, chairman; John N. Willys, Willys-Overland; A. H. Swayne, General Motors; A. R. Erskine, Studebaker, and W. O. Rutherford, president of both the Motor and Accessory Manufacturers' Association and the Rubber Association of America.

Accompanied by J. Walter Drake, Assistant Secretary of Commerce, this committee called on President Coolidge at the White House Friday morning. Chapin acted as spokesman for the committee. He outlined briefly to the president the great growth of the automotive industry and declared the industry is ready to assume the added responsibilities due to that growth. He called attention to the co-operation of the industry with various governmental agencies, including the standardization work of the Department of Commerce, the research work of the Department of Agriculture to aid in the economic and social problems of the farmer, the highway work of the Bureau of Roads, the safety work of the Bureau of Education, and the national defense plans of the army and the navy.

Following the conference with the President the committee met with Secretary Hoover for discussion of tentative plans for invitations to a Pan-American road conference to be held in the United States next spring.

In the evening the delegation was entertained at dinner by Assistant Secretary Drake, with Secretaries Hoover, Denby, Work and Wallace. Alfred Reeves, general manager of the N. A. C. C.; Pyke Johnson of the Washington office of the organization, and Norman C. Damon of the N. A. C. C., also were guests at this dinner.

SUES MIDWEST ENGINE CO.

INDIANAPOLIS, Oct. 15—Suit was filed in Federal court here last week against the old Midwest Engine Co. (the predecessor of the Midwest Engine Corporation) and Stoughton A. Fletcher, former president, and the bank which was trustee for the old company, to compel payment of dividends on Series A preferred stock. Suit was brought by George B. Ayers of Los Angeles and asked that the court order the defendants to pay into registry of the court

\$26,937.60 past due in dividends and redemptions and future dividends and that the money be then paid to the plaintiffs.

The new Midwest Engine Corporation which bought the property and organized under new management and capital is devoting its energy largely to repairing railroad freight cars. Its gasoline engine departments which have been producing some passenger car and other engines this year are said to be not operating.

Cincinnati "In Arms" Over Proposed Governor Ordinance

CINCINNATI, O., Oct. 16—Motorists in Cincinnati and in fact all over Ohio are up in arms against an election, called in Cincinnati on a proposed ordinance that would require all passenger cars and commercial vehicles to be equipped with an automatic governor and speed regulator, limiting speed to 25 miles an hour. The election is to be held Nov. 5, in conjunction with the regular election for municipal officers.

SALON EXHIBITORS ANNOUNCED

NEW YORK, Oct. 15-Announcement is made that the following cars will be exhibited at the nineteenth annual Automobile Salon to be held at the Commodore in New York Nov. 11-17 and at the Drake in Chicago Jan. 26-Feb. 2: Cunningham, Daniels, Duesenberg, Isotta Fraschini, Lancia, Minerva, Renault, Rolls-Royce and Winton. Coachmakers also will exhibit the Cadillac, Excelsior, Hispano Suiza, Lincoln, Locomobile, Marmon, Packard and Peerless. Body exhibits will be made by Brunn, Cunningham, Dietrich, Fleetwood, Healey, Holbrook, Hume, Judkins, Le Baron, Merrimac, Schutte and Springfield.

G. M. C. Contracts With the Standard Oil for Ethyl Gas

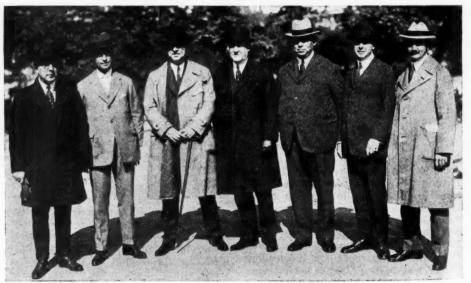
Synthetic Fuel, Developed by G. M. Research Laboratories to Be Distributed

DETROIT, Oct. 13.—General Motors Chemical Co. has entered into a contract with the Standard Oil Co. of Indiana for distribution of Ethyl gas in the states covered by this Standard Oil subsidiary. Announcement of the contract was made by C. F. Kettering, president of the chemical company, in an address before the Society of Automotive Engineers, in Chicago, Oct. 12.

Ethyl gas is a synthetic fuel developed by the General Motors Research Corp. It has the effect of taking the ignition knock out of engines. It is the result of several years of research and test at the General Motors laboratories in Dayton and has been successfully demonstrated in use in Dayton and Cincinnati where it has been on sale at a number of gasoline stations over the past several months. Ethyl gas has a light wine color which distinguishes it from ordinary automobile fuel.

Distribution by the Standard Oil Co. of Indiana will cover the states of Indiana, Michigan, Illinois, Minnesota, Wisconsin, Iowa, Missouri, Kansas, Oklahoma, South Dakota and North Dakota as quickly as installation can be made. This installation will be started in Indiana and carried through Illinois into Missouri and Kansas. The southern part of the distributing territory is being equipped this winter and the northern part will be equipped in the spring.

They Called on the President



Prominent executives in the automotive industry who called on President Coolidge at the White House. Left to right: John N. Willys, president of Willys-Overland, Inc.; Roy D. Chapin, chairman of the board of Hudson-Essex; A. R. Erskine, president of Studebaker Corporation; W. O. Rutherford, vice-president of B. F. Goodrich Co.; A. H. Swayne, vice-president of General Motors Corporation; J. Walter Drake, Assistant Secretary of Commerce; Alfred Reeves, general manager National Automobile Chamber of Commerce

M. & A. M. A. Members Get Space for National Shows

Show Management Now to Allot Space to Non-Members

NEW YORK, Oct. 15.—General Manager M. L. Heminway has completed his task of assigning space to members of the Motor and Accessory Manufacturers Association who will exhibit at the New York and Chicago national shows. With these cared for show management now will allot space to those equipment concerns which are not allied with the M. & A. M. A.

M. & A. M. A. members who will exhibit at both the New York and Chicago shows are:

A. C. Spark Plug Co., Flint, Mich.; Aluminum Company of America, Pittsburg, Pa.; All Clear Windshield Co., Inc., Fall River, Mass.; Allyne Zerk Co., Detroit, Mich.; American Auto Lamp Co., New York City; American Chain Co., Bridgeport, Conn.; American Federal Wheel Co., Milwaukee, Wis.; Appleton Electric Co., Chicago, Ill.; Arrow Grip Manufacturing Co., Glens Falls, N. Y.; Auto Specialties Manufacturing Co., St. Joseph, Mich.; Asch & Co., New York City; Bassick Manufacturing Co., Chicago, Ill.; Beneke & Kropf Mfg. Co., Chicago, Ill.; Beneke & Kropf Mfg. Co., Chicago, Ill.; Biflex Corporation, Waukegan, Ill.; Blackledge Manufacturing Co., Chicago, Ill.; Borg & Beck, Chicago, Ill.; Britton Auto Products Co., Inc., New York City; Brown-Lipe Gear Co., Syracuse, N. Y.; Budd Wheel Co., Philadelphia, Pa.; T. M. Brude Co., Chicago, Ill.; Bunting Brass & Bronze Co., Toledo, Ohio; Byrne, Kingston & Co., Kokomo, Ind. Carr Fastener Co., Cambridge, Mass.; The C. G. Spring Co., Detroit, Mich.; Champion Pneumatic Machinery Co., Chicago, Ill.; Cincinnati Ball Crank Co., Cincinnati, Ohio; Clark Equipment Co., Buchanan, Mich.; Columbia Axle Co., Cleveland, Ohio; Cuno Engineering Corporation, Meriden, Conn.

Dalton & Balch, Inc., Chicago, Ill.; Dayton Steel Foundry Co., Dayton, Ohio; Diamond State Fibre Co., Bridgeport, Pa.; Doehler Die Casting Co., Brooklyn, N. Y.; Eaton Axle & Spring Co., Cleveland, Ohio; Eberhard Manufacturing Co., Cleveland, Ohio; Eclipse Machine Co., Elmira, N. Y.; Folberath Auto Specialty Co., Cleveland, Ohio; Gabriel Manufacturing Co., Cleveland, Ohio; Gabriel Manufacturing Co., Schenectady, N. Y.; L. P. Halladay Co., Decatur, Ill.; Edward V. Hartford, Inc., Jersey City, N. J.; Robert H. Hassler, Inc., Indianapolis, Ind.; Hayes Wheel Co., Jackson, Mich.; The Houdaille Co., Buffalo, N. Y.; Jenkins Vulcan Spring Co., Richmond, Ind.; Kokomo Electric Co., Kokomo, Ind.; Lovejoy Manufacturing Co., Boston, Mass.; Metal Stamping Company, Long Island City, N. Y.; Moto-Meter Company, Inc., Long Island City, N. Y.; Noto-Meter Company, Inc., Long Island

Rokomo, Ind.; Lovejoy Manufacturing Co., Boston, Mass.; Metal Stamping Company, Long Island City, N. Y.; Moto-Meter Company, Inc., Long Island City, N. Y.; Nolenz, Inc., New York City; The Oaken Co., Indianapolis, Ind.; The Pantasote Co., New York City; Perfection Heater & Manufacturing Co., Cleveland, Ohio; Petroleum Motors Corporation, Rockford, Ill.; Pines Manufacturing Co., Chicago, Ill. Wm. E. Pratt, Mfg. Co., Chicago, Ill. Rajah Auto Supply Co., Bloomfield, N. J.; Rex Manufacturing Co., Connersville, Ind.; Ross Gear & Tool Co., Lafayette, Ind.; Ross Gear & Tool Co., Brooklyn, N. Y.; Stewart Warner Speedometer Corp., Chicago, Ill.; Stromberg Motor Devices Co., Chicago, Ill.; C. A. Taylor Trunk Works, Chicago, Ill.; Tonneau Shield Co., Inc., New York City; Trico Products Corp., Buffalo, N. Y.; U. S. Axle Co., Pottstown, Pa.; United States Chain & Forging Co., Pittsburg, Pa.; Vacuum Oil Co., New

Research in Automotive Engineering Only Way to Correct Faults, Says C. F. Kettering

General Motors Man Speaking Before Midwest Section of the S. A. E. Advocates Revision of Method of Teaching Engineering

CHICAGO, Oct. 13-In his talk before the Midwest section of the S. A. E. last night, Charles F. Kettering, President of General Motors Research Corp., suggested a revision in the teaching of engineering, laying particular stress on the simplification of physics. The fundamental laws governing mass and energy are the same in the field of science, he said, and the point has been reached where the electrical engineer and mechanical engineer must realize that each is working with the same factors. The electrical engineer feels he must solve his problems by Ohm's law and on the other hand the mechanical engineer feels he must have his own set of formulae. But, Kettering said, when you analyze all these formulae it works out that both are working with mass and energy in pretty much the same way.

Kettering said in his revision of engineering and teaching he would take the formula 1/2 mv2 and give it the general name of physics. In this simplified book of physics he would include the subjects of astronomy, engineering, chemistry, the electron and magnetism or radiation. He pointed out that in the final analysis of any problem involving chemistry, say, one generally finds that it becomes an engineering problem pure and simple. The botanist, for example, he said, makes use of astronomy, chemistry, magnetism or radiation and in the end his work with plant life becomes an engineering accomplishment.

The automotive engineer has to become more of a business man and engineering departments in general must be placed adjacent to the cost department. Engineering accomplishments can only be regarded as successful if the bank statements of the concerns making them show the accomplishments have been economically made. Changing one unit of a car to gain a certain point may have the effect of materially increasing the cost of the product at some other point and consequently from an economical standpoint the change was not satisfactory.

Naturally his talk brought up the subject of research work in engineering. Research, he said, is only the correction of a fault. The engineer who today thinks he has "arrived" with the product he now is making and leaves well enough alone will find that his product will stay that way, but the public eventually will not buy it. In connection with research work he mentioned a certain kind of paint which his company had found desirable for the open models of one of their cars. This paint had among other things in it beutal alcohol which was obtained from a certain species of bacteria, the latter being cultivated by only one firm, located at Terre Haute, Ind. The paint has rapid drying features and has been successfully applied to bodies. It has the desirable factor of looking as well at the end of a year as the day it was put on. A few difficulties arose in the application of the paint but this was solved. A new difficulty has been that the bacteria did not thrive in Terre Haute and the research problem now is to find a home for them where they can be grown successfully. The supply of beutal alcohol must be provided before the paint can be manufactured in quantity.

York City; Waltham Watch & Clock Co., Waltham, Mass.; John Warren Watson Co., Philadelphia, Pa.; Waukesha Motor Co., Waukesha, Wis.; Wheeler Schebler Carburetor Co., Indianapolis, Ind.; Wire Wheel Corp., of America, Buffalo, N. Y.

Those who will exhibit at New York only:

The American Hammered Piston Ring Co., Baltimore, Md.; American Taximeter Co., New York City; Bauch Machine Tool Co., Springfield, Mass.; Detroit Motor Casting Co., Detroit, Mich.; E. A. Laboratories, Inc., Brooklyn, N. Y.; Elk Machine Tool Corporation, New York City; Fulton Co., Knoxville, Tenn.; General Asbestos & Rubber Co., Charleston, S. C.; Link Belt Co., Indianapolis, Ind.; Light Manufacturing & Foundry Co., Pottstown, Pa.; Merchant & Evans, Philadelphia, Pa.; New Era Spring & Specialty Co., Grand Rapids, Mich.; Philbrin Corporation, Kennet Square, Pa.; Pyrene Manufacturing Co., New York City; Superior Lamp Manufacturing Co., New York City

York City; Weston Electrical Instrument Co., Newark, N. J.; Wyman Gordon Co., Worcester, Mass.; E. S. Budd Mfg. Co., Philadelphia, Pa.

Those who will exhibit only at Chicago:
Becker Bros., Inc., Chicago, Ill.; The
Buda Company, Harvey, Ill.; Continental
Motors Corporation, Detroit, Mich.; H. A.
D. Sales & Engineering Co., Bronson,
Mich.; Imperial Brass Manufacturing Co.,
Chicago, Ill.; Simplex Windshield Wing
Co., Chicago, Ill.

TELLS ABOUT BALLOON TIRES

INDIANAPOLIS, Oct. 15—Balloon tires, or low pressure air for automobiles, their development, advantages and probable popularity were described by J. E. Hale, chief of the development department of the Firestone Tire & Rubber Co., before 175 members of the Indiana section of the Society of Automotive Engineers at the first fall meeting of the section following a dinner at Hotel Severin.

Midwest Tire Makers Protest Radical Price Reductions

Association President Asks Attorney General to Investigate Recent Actions

CHICAGO, Oct. 13.—Discussion at the monthly meeting of the Midwest Rubber Manufacturers' Association centered around the protest filed recently with the United States Attorney General by the association's president against recent price reductions by large tire manufacturers. Considerable attention was given also to a report that large tire interests in New York City are working on a plan for the appointment of an arbiter who would be to the tire industry what Judge Landis is to baseball or Will Hays to motion pictures.

It was revealed at the meeting that acting on advice of certain members, Thomas Follen, president of the association, recently telegraphed to Attorney General Daugherty declaring that the Midwest members "feel the sole object of the recent price cut is to eliminate the smaller plants completely" and calling upon the Attorney General to take action that would avoid the extermination of the small tire manufactures.

The Attorney General's office, it was disclosed, acknowledged receipt of the complaint and stated that upon receipt of a full statement of facts evidencing any agreement to fix prices or otherwise restrain trade, with names and other details, it would immediately give the matter its attention. It was admitted by Follen and other members that concrete evidence of any such agreement as that complained of was lacking, and a number of the members declared they did not believe any such agreement existed. The matter was disposed of with the understanding that President Follen have the congressman from his district lay before the Attorney General such facts as he might hereafter be able to obtain.

Members of the Midwest association had only meager reports of the movement to select an arbiter, as none of them were active participants in the move. They were not certain any good could be accomplished by such an arrangement and they were extremely doubtful that it could be consummated.

Opinion seemed to prevail among the members that recent price reducing is evidence of a war among the large manufacturers and that the chances of the small producers to survive are as good as those of the larger ones.

A report was in general circulation among the members that plans for another price reduction had been made by one of the largest manufacturers. It was understood that this reduction was to have been made effective Oct. 15 but that it had been abandoned because of the opposition of banking interests.

Statistics of the Tire Industry

NEW YORK, Oct. 13.—Figures compiled by the Rubber Association of America show increasing production of pneumatic casings, inner tubes and solid tires, during August as compared with July.

During that month there was also a gain in shipments and a falling off in inventory.

The following table shows inventory, production and shipments for all of 1922 and for eight months of this year.

of 1922 and for eight months	NEUMATIC			
	No. Mfrs.			a
1922	Reporting	Inventory	Production	Shipments
January		4,174,216	2,055,134	1,596,806
February		4,691,329	2,084,308	1,562,365
March		5,183,286	2,645,790	2,073,963
April		5,464,336 5,523,095	2,401,187 $2,721,503$	2,086,651 2,639,273
June		5,042,147	2,838,890	3,133,260
July		4.834.106	2,476,636	2,695,095
August		4,629,392	2,905,209	3,029,823
September		4,612,037	2,504,744	2,502,106
October		4,682,958	2,674,662	2,588,770
November		4,964,976	2,733,134	2,379,708
December		4,599,208	2,656,942	2,934,079
1923				
January	62	4,695,916	3,127,270	2,994,297
February		5,224,387	3,217,967	2,588,639
March		5,670,601	3,865,726	3,322,637
April		6,088,272	3,539,326	2,976,160
May		6,906,594	3,659,986	2,757,764
June		7,040,600	2,956,943	2,502,185
July		6,471,124	1,992,989	2,539,425
August		6,058,387	2,355,915	2,807,432
	INNER T	UBES		*
1922	No. Mfrs. Reporting	Inventory	Production	Shipments
January		5.246.647	2,343,393	1,889,724
February		6,141,956	2,596,774	1,702,583
March		6,991,118	3,017,511	2,090,737
April		7,230,096	2,650,573	2,329,343
•	No. Mfrs.			
1922	Reporting	Inventory	Production	Shipmenus
May	65	7,189,552	2,970,696	2,938,947
June	64	6,186,534	3,130,629	3,973,679
July		5,675,839	3,068,199	3,630,744
August		5,207,228	3,808,224	4,220,055
September		5,164,757	3,501,442	3,558,971
October		5,408,033	3,787,758	3,420,680
November		6,210,053	3,850,908	3,075,023
1923		5,732,125	3,411,074	3,825,949
January	62	5,838,310	3,951,885	3,748,651
February		6,771,958	4,039,202	3,001,697
March		7,740,945	4,875,414	3,828,315
April		8,394,184	4,259,558	3,535,635
May		9,292,223	4,317,537	3,414,115
June		8,924,326	3,590,011	3,581,060
July		7,527,281	2,666,354	3,942,247
August		6,950,578	3,577,922	4,304,034
	SOLID T	IRES		
1000	No. Mfrs.	·	The . T	G1 1
1922 January	Reporting	Inventory	Production 40,224	Shipments
February		181,769 183,448	39,492	33,294 36,805
March		182,197	49,433	48,350
April		173,748	46,664	52,309
May		170,904		60.711
June		169,808	57,640 66,089	63,408
July		176,375	71,505	60,425
August		189,698	84,313	69,435
September		200,016	82,767	66,797
October		213,942	85,480	71.275
November		234,684	85,775	61,466
December		244,061	77,221	64,570
1923				
January		262,462	83,343	60,611
February		270,191	75,457	63,394
March		265,843	79,788	77,144
April		260,631	71,468	72,609
May		268,323	77,288	67,147
June		283,425	72,445	52,126
July		263,891	42,345	45,219
August	10	262,810	48,141	45,925

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipment" includes only stock forwarded to a purchaser and does not include stock forwarded to a warehouse, branch, or on a consignment basis.

Stevens-Duryea Is Sold to Ray M. Owen and Associates

New Owners Propose to Organize Fun Aplenty at Annual New Company and Continue Car Production

SPRINGFIELD, Mass., Oct. 15.—Sale of the plant and assets of Stevens-Duryea, Inc., to a syndicate headed by Ray M. Owen, president of the Owen Dyneto Co., of Syracuse, and including Roy Rainey, a steel and coke man, and R. W. Stanley of the Stevens-Duryea company, at a price of \$450,000 was authorized by Judge Richard W. Irwin of the Superior Court.

This action was taken following a continued hearing by the court at Northampton, Oct. 6, at which it appeared that no substantial headway had been made on a plan by a group of minority stockholders to take over the plant.

The new owners have not fully completed their plans but it has been decided to continue the manufacture of Stevens-Duryea cars as soon as they take possession of the plant. The receivership, which lasted 14 months, did not stop factory operations, for during that time the receivers manufactured and sold 116 new cars and disposed of '92 reconditioned cars, which netted a total of \$864,000. To the minds of the new owners, this proves that there is a good demand for Stevens-Duryea cars and they propose to meet it.

The Stevens-Duryea has been before the American public since May, 1906, when the Stevens-Duryea Co., a Massachusetts company, was organized, building what is claimed to have been the first American six-cylinder automobile as designed by J. Frank Duryea, brother of the pioneer Charles E. Duryea. The original company continued operations up to 1915 when it sold its plant and part of the equipment to the New England Westinghouse Co., which made use of the plant for war work. Following the declaration of peace Stevens-Duryea, Inc., was organized Nov. 19, 1919, and the manufacture of automobiles resumed, the company's personnel including: R. S. Deering, president; G. M. Berry, vicepresident and general manager; M. R. Leathers, secretary and treasurer, and P. W. Hine, sales manager.

Orders Slow Down in Parts Industries in Milwaukee

MILWAUKEE, Wis., Oct. 15-Although the condition is not general, there is to be noted a slowing down in orders as well as shipping directions on old orders in the automotive parts and units industries. This is regarded as a seasonal development, which has set in from 15 to 60 days later than customarily in past years. In a number of instances demands from factories are as active as ever and no intimation has been received of a slackening, although this is expected

Joy Ruled These Dealers for a Day

Clam Bake at Indianapolis

INDIANAPOLIS, Oct. 13-The second annual clam bake of the Indianapolis Auto Trade Association was enjoyed by 250 dealers, their helpers and friends last week, and John B. Orman, manager of the associations and its functions, won another testimonial for being a good provider.

The fun started off at 2 p. m. with a ball game between the Hope-to-Bees and



At the top are John B. Orman, secretary manager of the Indianapolis Auto Trade Association, and his efficient helper, Miss Cathern Riley, standing beside the sign board advertising their famous clam bake. The center photograph shows the men of the trade assembled for the feed. Newspaper representatives assigned to cover the event are seated at the table in the foreground. Below is a group of the merry-makers led by Fred S. Duesenberg of rac-

THE DAYS DIDDINGS

the Neverwassers, and who won will not be known until the engineers get new model slide rules to compute the runs. The balls were ballooned rubber types with infinitessimal unsprung weight and the bats were adapted from Bulgarian semaphores by a cubist artist from a local trim shop.

There was also African golf. Not the sort you think of. The cubes were a foot across and they were lettered with good Scotch terms.

Then clams and a sturdy joke on Orman, for when the end of the feed

drew near every owner of a used-carasylum and his helpers skipped the festive board and left a table full of orators all uncorked. John now says he never meant to have any speaking, anyhow. Be that as it may, there was none; and even the orators enjoyed the chance to linger with lobster and clams and some mighty near stuff that was tame. It was the biggest turnout the trade association ever staged, with plenty of salesmen who had a chance to participate by putting them over the week be-

to result momentarily, if past experience may be accepted as a guide.

It would appear that further announcements of new models by established factories are due between now and Jan. 1. Local foundries furnishing castings to well known makers are reported to have received blue prints which mean nothing less than preparations for volume production of designs of radical change by comparison with stock parts heretofore made.

PHILADELPHIA SALES MAINTAINED

PHILADELPHIA, Oct. 15-The aggregate volume of sales of passenger cars and trucks is far in excess of that for the corresponding period of 1922 and there has been no decline in the last month. Such previous recession as was shown was seasonal alone in character. Local dealers in both types of vehicles say that they expect normal business until well on toward show time.

Makers Adopt Conservative Production Policies Now

Many Companies Experience Shortage of Closed Bodies; Sales Better

DETROIT, Oct. 14—Manufacturers are adopting conservative production policies going into the fourth quarter of the year, policies which will keep output flowing at a pace strictly in keeping with actual business demands. With the exception of companies with recent new models, which are shipping to meet accumulated sales and to give dealers stocks of the new cars, the industry is close to being on an actual sales basis.

With the exception of Studebaker, no manufacturer has announced a definite curtailment of schedule in the last quarter, but everywhere there is a notable tightening of lines in keeping with seasonal influences. Many companies are experiencing the seasonal shortage of closed bodies and there is general agreement that closed bodies present an extremely large part of the demand, running ahead of even the large business of other years.

Several manufacturers with new models report that business would be as large in October as in earlier months of the year if they could get closed bodies in quantity and speed production to points possible when open models are selling. There is unanimity of opinion that aside from seasonal influences there is good demand for cars, and the general feeling is that the fall and winter months will compare favorably if not exceed those of other years.

Demand throughout the northern section of the country has switched largely to closed cars, manufacturers report, with continuing good demand for open models in the southern section of the country and on the coast. Open car buying outside of these sections is spotty, being stimulated somewhat by recent price cuts, but on the whole being supplanted by demand for the closed models. Business in the central west is reported showing somewhat better tone.

In the low priced lines there will be little reduction if any in production during the month. Ford Motor Co. will continue to operate at about 7,000 daily and Chevrolet declares operations will approximate 2,000 daily. The Ford figure for the month has been fixed at 183,700. Business is reported to be holding up very well at all points except in some sections of the northwest.

Middle-priced car manufacturers will go into October at much the same figures as have obtained during the last two months, except for the inequalities occasioned by growth in closed car demand. On the basis of early operation Buick will run around 20,000 for the month; Studebaker about 10,000; Hupp; Dodge 15,000; Olds 5,000; Oakland 5,000; Rickenbacker 1,250; Maxwell-Chalmers 6,000, and Reo 5,000. Hudson-Essex and Paige-

Jewett schedules will be interrupted during the month by plant changes.

In the higher priced lines Cadillac is operating approximately at a rate of about 2,500 for the month and Packard at approximately 2,000. Wills Ste. Claire is continuing at approximately the 300 monthly rate, preliminary to increased operations later in the year.

City of Milwaukee to Have Municipal Service Station

MILWAUKEE, Wis., Oct. 16—Organization of a municipal automotive service and repairshop for the city of Milwaukee is under way and the common council has been requested by R. E. Stoelting, commissioner of public works, to make an adequate appropriation for the construction of a model building wherein all service on the large number of city-owned passenger cars, motor trucks, tractors, street construction equipment and other machinery can be centralized. The creation of the office of superintendent of service at \$3,600 a year is also asked.

KNOXVILLE DEALERS HOLD SHOW

KNOXVILLE, Tenn., Oct. 16—Under the auspices of the Knoxville Automobile Dealers' Association the annual fall Automobile Show was held the latter part of September in connection with the East Tennessee Division Fair, at Knoxville, with virtually all of the dealers and distributors of Knoxville having display space at the show, which was the largest the association has yet held. There were 15 exhibitors at the show, displaying 30 different makes of automobiles, with a comprehensive series of displays by accessory dealers and jobbers.

ACCESSORIES AT SHOW

BALTIMORE, Md., Oct. 12—Accessories are to play a more important part in the annual automobile show to be held at the Fifth Regiment Armory in this city from January 19 to 26 under the auspices of the Baltimore Automobile Trade Association than at any previous show staged here. At the show last year many accessories were displayed, the galleries being turned over to this department, but this year's display is expected to be far greater and occupy more space.

STORE SHELTERS SHOPPERS' CARS

BALTIMORE, Md., Oct. 15—Entering into an agreement with The Hub, a large department store in the center of the city, the Mid-City Garage, Baltimore, which, as indicated by the name, also is in the heart of the city, is attracting quite a few shoppers into the establishment. The system has been in operation but a short time but it has demonstrated that it pulls.

TO CHANGE LAWS

BALTIMORE, Md., Oct. 12—With the 1924 session of the Maryland General Assembly only three months off, members of the various branches of the automotive business in Baltimore are beginning to formulate their plans to make important changes in the existing laws.

Discuss Value of Missionary Men as Sales Promoters

A. M. A. at Regular Meeting Also Talk on "Handling Jobbers' Sales Conferences"

CHICAGO, Oct. 15—"Can automotive products best be introduced to the retail trade and sales expanded through the employment of so-called missionary men or by some other method?" This was the question around which discussion revolved at the regular meeting Friday night of the Chicago group of the Automotive Manufacturers' Association. Another subject of discussion was "Handling Jobbers' Sales Conferences."

Advantages of the employment of missionary men to call on dealers were recited by sales representatives of the General Automotive Corporation. The three chief purposes of a "missionary man", it was stated are: first, to educate the dealers; second, to educate the jobbers' salesmen, and third, to sell merchandise.

Missionary men, it was stated, could best be employed to introduce a new product which is a specialty, or an old product in a new field or in a new sales unit. It was agreed in the discussion that a missionary could get best results when he represented only one article or a small line. Some manufacturers with large lines stated that when sending out missionary men they limited each to one or two articles.

The point was raised by some members that the amount of money it would cost to use missionary men probably could be spent more profitably in educational advertising in trade papers and elsewhere.

Some of the difficulties met with in the employment of missionary men were related. For instance, when the missionary man calls on dealers in a territory served by two or more jobbers who handle his line, the question arises as to what jobber's salesman will get credit.

It is best practice, speakers said, to have the dealer select his own jobber. But afterward when the rival salesman calls on him and wants to know why his firm didn't get the order the dealer, it was said, is tempted to pass the responsibility of selection on to the manufacturer's missionary. Then a disgruntled jobber has to be placated.

The question of credits is another trouble maker. A manufacturer's missionary calling alone on dealers may succeed in getting many orders which he routes through jobbers. The jobbers may refuse to fill the orders on the terms made by the missionary man because the customers may not have good credit rating, or may not have an account with the particular jobber getting the order.

It was announced that the sales service committee of the association is endeavoring to prepare a schedule showing all the jobbers' sales conferences to be held this winter, together with information as to whether or not they desire manufacturers' representatives to attend.

BUSINESS NOTES

Reiter-King-Dugan Co., manufacturer of gasoline gages, announces the opening of a Cleveland office at 305 Plymouth Building in charge of A.L. Holmes, and a Detroit office at 410 Burns-Gray Building in charge of G. B. Holmes.

The Carlisle stockholders' protective committee, of which William Fischer is chairman, which was appointed at a recent meeting of stockholders of the bankrupt Carlisle Tire Corp., has retained counsel and announces its intention to conduct an investigation into the company's affairs to learn what became of the \$2,000,000 subscribed by the stockholders. It is hoped to recover some of the money for the stockholders.

Offices of the Automotive Manufacturers' Association have been moved from the Consumers Building to the State-Lake Building, 190 North State street, Chicago.

The Phillips Custom Body Co. of Cleveland, has purchased the plant of the Trumbull Mazda Lamp Co. at Warren, O., and plans have been made to start operations within a month, employing more than 400 hands. This company, of which Frank N. Phillips is president, recently purchased the Artcraft Top Co. of Cleveland, and Artcraft tops also will be manufactured in the Warren plant.

The Circuit Court of Appeals has denied the petition of the Pyrene Manufacturing Co. for a rehearing of the appeal in the decision handed down in the United States Circuit Court of Appeals last July in the case of the Moto-Meter Co., Inc. and Harrison Boyce vs. the Pyrene Manufacturing Co.

The Weeks Mfg. Co., Milwaukee, manufacturer of auxiliary carburetion devices and thermostatic specialties, has filed a voluntary petition in bankruptcy. The principal creditor is the Clum Mfg. Co., 425 National avenue, a large manufacturer of automotive equipment specialties, which produced the merchandise sold by the Weeks Company. There are no assets. The first meeting of creditors has been called for Oct. 12.

Directors of the Buffal Truck and Tractor.

Directors of the Buffalo Truck and Tractor Corporation, Buffalo, N. Y., have been elected as follows: George B. Burd, C. W. Dippert, V. A. Ellsworth, J. F. Herbert, G. Herbert Swick, F. A. Weeks, Morris L. Gaskill. Officers elected were: President, Morris Gaskill; vice-president, John F. Herbert; secretary and treasurer, W. D. Floger and assistant treasurer, F. A. Weeks.

The Shaler Export Co. of Waupun, Wis., is a new Wisconsin corporation organized with a capital consisting of 500 common shares without parvalue, to handle the export sales and other business of the C. A. Shaler Co. of Waupun, a large manufacturer of vulcanizing equipment, tire specialties, headlight lenses, etc. C. A. Shaler is the president of the new concern as well as of the original company.

The E. G. S. Mfg. Co., Akron, O., has been chartered with an authorized capital of \$10,000 to manufacture and sell automobile parts, tools and accessories.

The Gary Motors Distributing Co. has been incorporated in Indiana as a selling agency for Gary motor trucks. The new company has a contract with the manufacturing company, has a contract with the manufacturing company, the Gary Motors Corp. of Gary, Ind., to distribute its entire output throughout the United States except in the states of Illinois and Iowa and a part of Indiana. Under this new arrangement Robert Growther, formerly manager of the motor truck plan, has returned to his old position. Theodore Zumstein, who has been sales manager of the truck corporation, will be sales manager of the distributing corporation. A branch of the distributing corporation has been opened in Cincinnati and negotiations are under way for branches in Washington, New York and Buffalo.

Dunlop Tire & Rubber Co. is rapidly reaching

Dunlop Tire & Rubber Co. is rapidly reaching the state of nation-wide distribution. Recently wholesale branches have been opened in Milwaukee, Wis., Atlanta, Ga., Chicago, Ill., Seattle, Wash., and Los Angeles, Cal. Serving surrounding territories, these centers, in addition to previously established ones, take Dunlop into practically all the important tire-using states of the nation.

many from becoming owners because they are too apprehensive of the difficulty of driving in such conditions, Taylor said. If given instructions in driving and then shown how to handle a car in traffic they would realise that the problem, is not so serious as they had imagined and would be the more likely

National Movement to Teach Automobile Driving Suggested

DETROIT, Oct. 15—As a means of bringing thousands of new prospects into automotive ranks, a national movement to teach the driving of cars is suggested by Norman I. Taylor, advertising counsel for Columbia Motor Co. By undertaking to teach those who express a desire to learn, Taylor declares that the dealers of the country will find a large number of persons so instructed ready to step into the ranks of buyers.

The movement suggested itself to Taylor by the earlier experiences of sellers of riding horses, who had to first demonstrate in almost every case the fact that it was possible for almost anyone to stay on a horse and ride if properly instructed. No one would buy a horse without first getting into the saddle and getting the thrill of it, and this once accomplished, the ambition to own a horse became one that must be realized.

Inability to drive a car today is something which most persons admit reluctantly and self-consciousness in this respect is keeping back a certain amount of sales, Taylor said. On the other hand there are thousands who have never known the thrill of sitting behind the wheel and who have never therefore been sufficiently interested to step into the ranks of owners. Many families which should have several cars have only one because the head of the family wanted to have possession at all times.

Newspaper accounts of accidents and the sight of heavy traffic are keeping

ENLARGE EMPLOYMENT SERVICE

to become owners.

CHICAGO, Oct. 16—Carrying out the purpose of a resolution adopted by the Automotive Equipment Association at its Dixville Notch meeting last summer, the executive officers of the association are enlarging the employment service which has been provided for members for several years.

Arrangements have been made for listing at the A. E. A. office requests of members for responsible help and application of individuals for employment. A new feature of the service is the investigation by the A. E. A. of each applicant whose name is listed with it. The applicant will be required to fill out a standard application form, giving among other information places of previous employment and references. The association will make a thorough investigation so that any member firm may feel safe in employing an applicant on the basis of its report.

To facilitate the bringing of employers and applicants together want-ads of both help wanted and employment wanted, based on requests on file with the association, will be published in the A. E. A.'s semi-monthly news bulletin, The Leader.

Peoria Dealers Elated Over Success of Annual Show

Fall and Winter Business Expected to Be Very Good as Result

PEORIA, Ill., Oct. 15—Taking stock of the results of the annual show of motor cars, trucks and tractors, the members of the Peoria Automobile Dealers and Accessories Association, feel elated over the great success and believe that the stimulant to fall and winter business will be very helpful. The exposition opened Sept. 28 and concluded Oct. 6. The dealers' exhibit in the building set aside for the purpose, covered 38,000 square feet of floor space.

"While the fall show of the association has always been attractive and interesting, it was doubly so this year, because of the marked improvements in practically every make of car shown," said Secretary F. C. Zillman, who served as manager of the event. "The public welcomed the opportunity to see the new models, grouped so that they could make comparisons."

The center aisle of the building was devoted to accessory displays. Each exhibit of cars was marked by metal shields in brackets containing the name of the car and the distributor. These shields enabled visitors to quickly locate any desired car or exhibit.

Space was reserved for the exhibit of the state highway department, showing the progress of state bond issue hard road construction in Illinois. The Peoria dealers never do things by halves and the annual show was no exception to the rule. The recent campaign that they conducted for new members of the state association, was an excellent demonstration of energy and persistence. Few associations, affiliated with the state body, even approached in new memberships, the remarkable record of the Peoria dealers. As a result of their accessions, the state organization is now in the strongest position since it was first projected and justifies an effort toward organizing the dealers into local associations in various counties in southern Illinois, a territory that previously has been neglected.

LIGHT SEDANS IN ENGLAND

PARIS, Sept. 20 (By Mail).—Adoption of the Weymann system of light weight sedan body construction is announced by the Daimler, Sunbeam, Talbot, Singer and Triumph companies of England, in addition to the Rover company, which was the first to take up this French novelty. There is an impression that the first of the wood and fabric leather bodies built by these companies, will be ready for the London show.

On the latest bodies the Weymann Company has abolished the imitation cane work finish for special grained fabric leather. The latest style of body is described as a "false cabriolet," being one which has all the appearance of a cabriolet, but will not open.

IN THE RETAIL FIELD

More than 200 Willys-Knight and Overland dealers from the Dallas territory attended a conference at the factory branch in Dallas for the purpose of discussing business plans for the fall and winter. They were guests of J. J. Gough, branch manager. Dealers said the outlook for trade is excellent. and winter. They branch manager. trade is excellent.

trade is excellent.

Distribution of the R & V Knight motor cars in Texas has been taken over by the Texas R & V Knight Co. of Dallas. The company completed organization recently and is now planning to place retail dealers all over Texas. The company is composed of R. A. O'Rourke, E. L. McManamon and J. L. O'Rourke. The company will carry a complete line of parts to take care of dealers' wants.

of dealers' wants.

The Smith Motor Co. of Liberty. Tex. has been incorporated. The capital stock is \$10,000. Among the incorporators are H. C. Smith, J. K. Miller and Lawrence Kay.

The Chittim Motor Co. of Houston, Tex., now occupies its new \$100,000 home. These Ford and Lincoln dealers are said to have one of the most completely arranged and equipped automobile houses in the southwest.

Large and attractive sales rooms have been opened by the Buffalo Flint Co., Inc., in 1298 Main street, Buffalo, N. Y. The company has the distributing agency for the Flint car. John Stacey is manager.

Distribution for the Rickenbacker automobiles in the Dallas, Tex., territory has been awarded to W. G. Langley and W. E. Knighton, head of the Franklin Motor Co. of that city. Sales agents are now being named.

Schuyler W. Goodrich, proprietor of the East Street Garage in Pittsfield, Mass., has opened the West Street Accessory Shop in that city, carrying a full line of Goodyear tires, equipment and oils.

and oils.

Ed Gillispie, manager of the Central Used Car Market, Springfield, Mo., has leased a large lot just east of the Chevrolet building and is having plans prepared for a building that will run the full length of the lot on both the east and west side, 16 feet in width. The acquisition of this property was made necessary to provide room for the new line of Oldsmobiles. The Oldsmobile show room will be located at 463 St. Louis street, which was formerly occupied by the Central Used Car Market. Car Market.

Ewart-Brewer Motor Co., 419 South Twenty-first street, Birmingham, Ala., distributor of Haynes, Columbia and Cole cars, has established an accessory department and will handle Star and Goodrich tires and the Willard battery.

Cecil Shinneman, Weldon, Ill., has purchased the garage and sales agency operated for a number of years by his brother, Vernon, and plans to enlarge the business and make a number of

improvements.

The Peoria-Flint Motor Car Co. has been organized at Peoria, Ill., and will distribute the Flint car in the Peoria county territory. Temporary quarters have been opened at 229 North Jefferson street. After Nov. 1 the company will occupy a new building at 304-6 North Jefferson street.

The Groves Motor Car Co., Ford dealer in Cape Girardeau, Mo., is instituting erection of a new garage building at the corner of Prague and Spruce streets.

The Neosho Motor Co. of Neosho, Mo., has filed incorporation papers. The corporation was formed for the purpose of taking over the agency for the Chevrolet.

Don Miller, dealer for the Chevrolet in St. Joseph, Mo., has bought the Chevrolet agency in Atchison, Mo., from Jim Byram and John Robbins.

Canavan Motors Corp., with sales and service establishments at San Francisco, Cal., and Portland, Ore., has been appointed Pacific Coast distributor for the Diamond T motor truck. Jerome Canavan is president of the company.

Sturtzer & Co., Inc., 26-28 Goodrich street, Buffalo, N. Y., has taken over the distributorship of the Lomar shock absorbers in Erie, Niagara, Orleans, Genesee and Wyoming counties.

The Western Massachusetts Moon Co. has been formed in Springfield, with A. L. Bengle as head. Sub-dealers will be named in outlying

Hoffman-Dicks Motor Co., St. Louis Chevrolet dealer, has opened a new service station Chevrolet cars at 5711 Delmar boulevard.

A new building costing \$60,000 and providing 16,000 square feet of floor space, devoted entirely to Lincoln cars, has been opened by the Riefling Automobile Co., St. Louis, a Ford and Lincoln dealer. Invitations have been sent to all Lincoln owners and prospects in Riefling's district to attend the opening. The building will be located at 2501 South Jefferson avenue.

The Fishell Tire Service Co., St. Louis dis-tributor for Miller tires, has added a tire repair shop to its premises at 3454 Lindell boulevard.

The Reeves Auto Co., Ottumwa, Ia., opened its new garage and salesroom at 207 West Second street last week and its 62x200-foot floor is one of the largest in southeastern Iowa. The building has been under way since May and replaced the old one on the same site without interrupting business and without razing the old one until the new was practically finished. George Reeves, the owner, is agent for the Hudson, Essex, Nash and Packard cars in that territory.

Andy Burt has opened a store at 2103 South Michigan avenue, Chicago, for the distribution of Oilzum oils for automobiles.

The L. D. Frint Motor Co., Milwaukee, distributor of the Oldsmobile in Wisconsin and Upper Michigan, has announced the following appointments of retail dealers in Milwaukee county: Jaeger Automobile Co., Dietz Motor Co., Fuller Sales Co., Charles Siegel & Son and W. A. Jaeger Motor Sales Co.

J. M. Lederer, St. Louis Overland and Willys-Knight dealer, has opened a new showroom at 3325 Washington boulevard.

F. D. Eastman, Rockford, Ill., has taken over the Williamson Motor Co. used car market in that city and will operate it under the name of the Eastman Used Car Market. It will be oper-ated independent of the Williamson company and will occupy larger quarters in the future, man was formerly with the Ford Motor Co.

Henderson & Christopherson, for the past year Dodge dealers at Stanley, Wis., have taken the Chevrolet franchise.

Dr. T. V. B. Crane is planning the erection of a two-story brick garage building at Springfield, Mo., to be occupied by the Pipkin-Tenner Service station, a recently organized firm; the Heyte Motor Co., distributing the Cadillac cars, and the Dillen Brothers Cadillac service station.

The Newton County Hardware Co. of Neosho, Mo., has secured the agency for the Star-Durant line of automobiles.

For the third time since 1915, Tate Motor Co., Inc., Dodge Bros. distributor at St. Louis, has found it necessary to enlarge quarters. A new three-story reinforced concrete building will be erected at Garrison and Washington avenues. The approximate cost of ground and building will be \$250,000. There will be 60,000 square feet of floor space available in addition to 20,000 square feet of floor space available in addition to 20,000 square feet on the roof which will be used for the parking and storage of cars. A ramp and elevator will be run to the roof for such purposes.

Chambers & Long, downtown Ford dealers in Chambers & Long, downtown Ford dealers in St. Louis, have arranged a sales contest for their force which will cover an entire year with a trip to the Ford factory in Detroit at the end of the period for those salesmen who reach their quota for the year. For the salesman who reaches the highest point above his quota there will be provided a trip to New York in addition to the tour of the Ford factory.

Gard Gale, Columbus, O., central Ohio distrib-utor for the Gardner, has been notified that his territory has been increased to 40 counties. For-merly it was 20 counties.

The Kempi-Baxter Motor Co., Canton, O., has been incoporated with a capital of \$25,000 to buy, sell and deal in motor vehicles, parts and access-

The Blue Ribbon Automobile Co. at Columbus, O., has been chartered with an authorized capital of \$10,000 to buy, sell and deal in automobiles, parts and accessories.

biles, parts and accessories.

Frank Radford & Co., 1700 North Charles street, Baltimore, have taken over the distributorship of the Haynes line, formerly handled by William J. Meyers. The Radford company has given up the Jordan dealership. Coincident with the change many improvements are being made at the establishment and it has been announced that plans are under way for the construction of one of the largest service stations in the South, which will be used for Haynes service. will be used for Haynes service.

B. B. Nyce, general manager of the Baltimore Peerless Co., Baltimore, has announced the ap-pointment of Charles Kirwan as sales manager.

Charles W. Hallar, president of the Quaker City Chevrolet Sales Corporation of Philadelphia, has signed up as distributor of Overland and Willys-Knight cars for Philadelphia county. The new concern will be known as the Overland-Hallar Corporation and the contract goes into effect Nov. 1. The office and salesrooms of the new corporation will be at the southeast corner of Forty-second and Chestnut streets, now occupied as a salesroom by Willys-Overland, Inc., of Philadelphia. The other salesroom of the Quaker City Chevrolet Sales Corporation, Broad street

above Poplar, will be used as a salesroom for Overland and Willys-Knight cars.

Four hnudred Willys-Overland dealers from eight states within the territory served by Willys-Overland, Inc., of Philadelphia, attended a meeting and dinner at Green Hill Farms, Overbrook. In addresses made by D. B. Dorris, R. R. Lokey, George D. McCutcheon and Frank L. Weithoff, dealers were told of co-operative plans for 1924. Two new car models were exhibited.

Heldt & Timperman, Clinton, Inc., have been

Heldt & Timmerman, Clinton, Ia., have been appointed agents for the Willys-Knight and Overland cars in that vicinity.

Maxton Motor Co., Maxton, N. C., has been chartered with an authorized capital stock of \$25,000.

Ellerbe Motor Co., Ellerbe, N. C., has been chartered with a capital stock authorized of \$50,000.

Among new Auburn dealers are the following:
O. I. Caples & H. Faller, 179 Fairfield avenue,
Bellevue, Ky.; Clapsadle & Heacock, Lisbon, O.;
Patrick's Garage, Westernport, Md.; Kunde Motor
Co., Oshkosh, Wis.; Prospect Garage, Moore,
Pa., and the Evanston Motor Sales Corp., Evanston, Ill.

ton, Ill.

Barrow's Motor Co. has joined the Burlington (Ia.) motor row, with the opening of its salesrooms at 208 South Main street. The agency handles the Moon car in Des Moines, Henry and Louisa counties, Iowa, and Henderson county, Ill. C. A. Barrow is associated with his father, W. H. Barrow, in the business.

The Keokuk (Ia.) Buick Co. has purchased the Fort Madison (Ia.) Buick Co. from M. B. Pease, its manager for a number of years. W. F. Krebill will take over management of the Fort Madison branch.

The following concerns have taken Nash dealerships: Butler Nash Co., Butler, Pa.; Farrel Motors Co., Farrell, Pa.; Herr & Co., Lancaster, Pa.; Yukon-Motor Sales Co., Yukon Pa.; Morrison Cove Garage, Roaring Springs, Pa.; Fourth Street Garage, Huntington, Pa.; J. Miller Kalbach Co., Inc., Reading, Pa.; Rothenberger & Ritter, Macungie, Pa.; Ralph Shipman, Sunbury, Pa.; J. K. Hatton, Clinton, S. C.; Sumter-Nash Co., Sumter, S. C.; McIntosh-Chevrolet Co., Kingstree, S. C.; H. L. Sherk, Wakonda, S. D., and J. M. Sharp, Jacksboro, Tenn.

The Kinkead Motor Co., Cedar Rapids, Iowa.

The Kinkead Motor Co., Cedar Rapids, Iowa, has taken the Moon agency for that territory and is displaying models at the salesrooms, 107 South First street.

South First street.

The Rubber Tire Supply Co. of Springfield, Mo., has leased the Haskett-Mace building at 457 St. Louis street, and will occupy it about Oct. 20. Extensive improvements are already under way. Back of the show room a large used car sales and display room has been provided while the balance of the building will be occupied by the shop and stock room of the Rubber Tire Supply Company, distributor of Nash cars.

Oliver Wyatt of Springfield, Mo., has formed the Wyatt-Oakland Sales Co. and will distribute the Oakland car in that city and vicinity.

The Scheuer Auto Co. Ninth and Commercial

The Scheuer Auto Co., Ninth and Commercial streets, Manitowoc, Wis., has purchased the garage built a few years ago for the Major Auto Co. at Tenth and Buffalo streets. Jay Hall, proprietor of the building formerly occupied, intends to organize a new sales and service concern to take possession.

John Root has purchased the Bryant Garage in Commercial avenue, Jefferson City, Mo., and has taken charge.

Fax Musgrove has sold his "Fix-It" garage on Lewis street, Canton, Mo., to the Claws Brothers of Ewing, who have taken charge.

of Ewing, who have taken charge.

Clifton Coolin of Stanberry, Mo., recently closed a deal whereby he becomes the owner of the Jefferson-Highway garage, formerly owned by W. R. Hines and Dale Depriest.

George M. Schwartz and associates have taken over the Consolidated Auto Sales Co., 1022 Cathedral street, Baltimore, formerly operated by J. J. Stuart. The company is distributor of the Stephens. The service station has been removed from the Cathedral street address to the Jenkins Motors Co., North and Mt. Royal avenues, and extensive improvements will be made to the showrooms.

The Rolls-Royce now is being offered to the public of Baltimore and surrounding territory through the Petersen Motors-Baltimore, Inc., of which Reid C. Scott is manager. The first model, a phaeton, has arrived and is attracting a great a phaeton, has as deal of attention.

Harry Crouch, who operates the Crouch Auto Co., Baltimore, has opened his new showrooms at 1100 Cathedral street. Crouch is a Reo dealer.

A new dealer for Paige and Jewett cars under the Newell Motor Car Co., St. Louis distributor, was opened last week at the corner of King's highway and Delmar. F. W. Wolffe is president

of the company.

Oldmixon & Lee have taken over the People's Garage in Springfield, Mass., and will use it for

(Continued on next page)

CONCERNING MEN YOU KNOW

A. J. Roemer has been appointed assistant sales manager of the Multibestos Co., Walpole, Mass.

James A. Grier has been appointed retail sales anager of the Detroit branch of the Cadillac lotor Car Co., which will soon occupy a new ailding on Jefferson avenue.

building on Jefferson avenue.

F. O. Scudder has resigned from the position of sales manager of the Duesenberg Automobile & Motors Co., Indianapolis. He will leave the automobile industry to enter business for himself. His resignation became effective Oct. 1, but at the request of the officials of the company he remained at his desk for a few days longer to help clear up some unfinished work. help clear up some unfinished work

W. A. James has been promoted to assistant sales manager of Hudson Motor Car Co., having been advertising manager for the past several years. He will continue to supervise the activities of the advertising department.

George T. Willett, who has been assistant to P. H. Brockman, president of the De Luxe Automobile Co., St. Louis Oldsmobile distributor, has been named manager of the wholesale department. He will have charge of territorial distribution on the new Oldsmobile Light Six.

Prices by Congress in December

more searching inquiry into gasoline

prices is anticipated when Congress convenes in December. The wide spread

between the retail price at service sta-

tions in the west and along the Atlantic

seaboard causes suspicion as to market-

ing methods of the large refineries.

Several legislators who have returned to

Washington have expressed the opinion

that the situation is worthy of investi-

gation and remedial legislation, if

It is declared that eastern consumers

receive no benefit from the low freight

rates on this product when shipped by

the water route. In California and other

western states the price of gasoline has

been as low as 11 cents per gallon but

the eastern quotations are fixed at 21

cents. In the middle west, the price

WINS TRUCK SELLING CONTEST

contest among the distributors of Ser-

vice Motors, Inc., makers of Service

motor trucks, was won by Dix Motors,

Inc., of Long Island City, distributor for

the boroughs of Manhattan and Queens in New York City. Second place went to

the Pyramid Sales Corporation of New-

LUBECK VISITS EASTERN DEALERS

KOKOMO, Ind., Oct. 13-Returning

WABASH, Ind., Oct. 12-A recent sales

averages about 16 cents.

necessary.

WASHINGTON, Oct. 14-Another and

Another Inquiry Into Gas

Thomas Oscar, head of Thomas Oscar & Son, Stoughton, Wis., pioneer Ford dealers, died Sept. 29 at the age of 62 years.

Thatcher Shellabarger, Decatur, Ill., died Oct. 4, after a brief illness with organic heart trouble. He was 31 years of age and had been associated with his father, William L. Shellabarger, in the motor car distribution and accessory business since early youth. His brothers, David and William, will continue the business.

Earl F. Schoeberlein, secretary-treasurer of the Kelley-Larson Motor Car Co., Aurora, Ill., died suddenly at his home in that city on Oct. 1, from heart failure. He was prominent in commercial circles of Aurora and was a member of the Union League Club of Chicago.

Wallace E. Propst has been advanced to post wallace E. Fropst has been advanced to post of assistant sales manager at the Miller Rubber Co., Akron, O. Propst was formerly manager of the Burlington, Ia., branch of the B. F. Goodrich Rubber Co., but for the last three years has been manager of the Milwaukee branch office of the Miller Rubber Co.

PATENT SUIT DISMISSED

DETROIT, Oct. 5.—The suit by the B. F. Goodrich Co. and Kelsey Wheel Co., against the Hayes Wheel Co., and James F. Wagenhorst, for infringement of patents, was dismissed by Judge Tuttle in Federal Court here this week, the court

It was alleged in the suit that wheels made by Hayes violated three patents held by Goodrich and licensed to Kelsey covering the internal part of the wheel, the rim and the process by which the

Goodrich Issues Statement

AKRON, Oct. 6 .- The following state-

"In a suit brought by the Kelsey

ASSOCIATION PROVIDES INSURANCE

HARRISBURG, Pa., Oct. 14-The Penn-

of education has authorized the establishment of a two-weeks short course in construction, operation, repair and maintenance of tractors and gas engines, for men of 16 years of age and upwards. The course will be supplied by state university instructors and classes meet from 1 to 4 o'clock in the afternoon.

Cash Basis for All Business Is Tried Out in Alabama

Andalusia Dealers Report That Volume Has Not Dropped Off Any

BIRMINGHAM, Ala., Oct. 15-The people in the automotive industry throughout Alabama and in many other mercantile and sales lines are watching the experiment of the members of the Andalusia, Ala., Automotive Association in putting their business on a purely cash basis. In doing this the automotive dealers of Andalusia are taking a radical departure from the methods of doing business in that section of Alabama. Since the Civil War, at least, and possibly long before that time, the merchants of Alabama and in nearly all the rest of the southern states have been granting the farmers credit from crop to crop. The dwellers in the cities have been paying their bills as the spirit moved them.

ruling there was no infringement.

spokes are made fast.

ment was issued today by the B. F. Goodrich Co. regarding the decision in the suit brought against the Hayes Wheel Co. and others:

Wheel Co. and the B. F. Goodrich Co. against the Hayes Wheel Co. and others in the United States District Court at Detroit, Judge Tuttle held in a decision rendered Sept. 29, that the patent in suit was not infringed by the defendant's process. The complainants gave notice of appeal and the decision will be referred to the United States Circuit Court of Appeals at Cincinnati for review at the earliest date possible."

sylvania Automotive Association is offering an insurance service to its members through which it declares they will be enabled to save from 20 to 55 per cent in premiums for protection of their building and stocks of cars and accessories.

TRACTOR CLASS IN SCHOOL ARMSTRONG, Ill., Oct. 15-The board

(Continued from preceding page)

(Continued from preceding page)

J. O. Reynolds has taken the agency for the Flint in Northampton, Mass.
Chandler Motors of Springfield, Inc., has opened a new salesroom in Springfield, Mass.

Leo. J. Haskett, manager of the M. & W. Motor Co., Springfield, Mo., distributor of Studebaker cars, was elected president of the Springfield Automobile Dealers' Association at the annual meeting held at the Colonial Hotel. John McGregor, of the McGregor Motor Co., was elected vice-president, C. F. Aurand, of the Rubber Tire Supply Co., secretary, and O. R. Palmer, of the Standard Motor Co., treasurer.

Ransford Motor Co. has been chartered at high Point, N. C., with an authorized capital of \$50,000.

Ransford Motor Co. has been chartered at High Point, N. C., with an authorized capital of \$50,000.

A factory branch of the Peerless Motor Car Co. of Cleveland, O., will be opened in Dallas, it is announced by D. A. Burke of Cleveland, vice-president of the company. The branch will be in operation by Nov. 1, it was said. The Dallas branch will serve the entire state of Texas and the northern part of Mexico. Every product of the Peerless company will be carried by the branch factory with a complete line of parts and accessories for distribution throughout the southwest. Burke announced Geo. B. Gillespie of Memphis, Tenn., and B. F. Scholler of Kansas City will be connected with the Dallas branch. He also announced the company of a new car to be known as Collins Six, named in honor of R. H. Collins, former president of the company. The following concerns have been appointed to handle the Chandler car: Kahney & Hammann, Kankake, Ill.; Kennish Hardware Co. Kewanee, Ill.; F. A. Calderwood, Inc., Springfield, Mass.; Clifford & Bradley, Minneapolis, Minn.; Hartington Auto & Truck Co., Hartington, Nebr.; Fairchild Motor Sales Co., Reno, Nev.; M. D. Baker Co., Portland, Ore.; John Flanagan, Ventura, Calif.; Lamont & Bushlow, Cherokee, Ia.; Lee Motor Car Co., Brooklyn, N. Y.

The Alderson Motor Company of Terrell, Texas, has been incorporated. The capital stock is \$45,000.

The Trico Products Co. of Buffalo, N. Y., has filed plans for the erection of a \$100,000 concrete

The Trico Products Co. of Buffalo, N. Y., has filed plans for the erection of a \$100,000 concrete addition to its plant at 624 Ellicott street. The company, of which John Oishei is president, manufactures automobile supplies.

The new Riverside Motor Co. has opened at Columbia, S. C., handling Franklin and Cleveland automobiles and parts. S. T. Carter is president of the company, and P. H. Hodges, secretary and treasurer.

of the company, and P. H. Hodges, secretary and treasurer.

Among new Nash dealers are the following: Brown Humphreys Motor Co., Greenville, Tenn. Thompson Wesson Nash Sales Co., Trimble, Tenn.; Fannin County Nash Co., Bonham, Tex.; Mikulenka Motor Co., Yoakum, Tex.; J. M. Reid Auto Co., Laredo, Tex.; Haynes & Eusom, Runge, Tex.; Fairmount Motor Co., Honaker, Va.; Beasley-Nash Motor Co., Norfolk, Va.; H. B. James, Charlottesville, Va.; J. Ed. Blakeley & J. W. Blakely, Welch, W. Va.; Nash Motor Sales, Parkerburg, W. Va.; Moses J. Belcher, Walter Belch & W. E. McBride, Anawalt and J. K. Abbott Garage, Buchannon, W. Va.

from an extended trip through Eastern territory, E. M. Lubeck, general sales

manager of the Apperson Bros. Automobile Co., reports substantial increase in the demand for Apperson cars and conditions of general business good.

DINNER MEET IN LOUISVILLE

LOUISVILLE, Ky., Oct. 15—Dealers in all branches of the automotive industry in Kentucky will be invited to a dinnermeeting of the Louisville Automobile Dealers' Association Tuesday, Oct. 30, at the Brown Hotel.

The READERS CLEARING HOUSE

Questions & Answers on Dealers Problems

Speedometer Gear Calculations

Q—Give information which will enable us to figure out the number of teeth required in speedometer pinions and gears for Stewart and A C speedometers when the tire size and gear ratio is known. Also give example of how to find size of gears when the following data is given.

Gear Ratio Tire-Sizes 3.77 30x3 ½ 3.63 30x3 ½ 3.90 30x3 ½

Figure out the gear ratios on the above problems both for front wheel drive and speedometer drive from the propeller shaft.—E. J. Herbst, Riverton, Minn.

The following data and formula are furnished by courtesy of the Stewart-Warner Speedometer Corp.

Formula for Figuring Correct Pinion on Stewart Speedometers

CODE:

A-No. of teeth in drive gear.

B-Axle Ratio.

C-Rev. per mile of tire.

D—Swivel Joint ratio.

E—Rev. per mile of Flex. shaft (1009).

F-Actual tire diameter.

G-No. of teeth in fibre pinion.

For Front Wheel Drives:

(1)
$$\frac{A \times C}{D \times E} = G$$
, or (2) $\frac{A \times C}{D \times G} = E$,
or (3) $\frac{20 \times A}{D \times F} = G$.

For Universal Joint or Propeller Shaft Drives:

(4)
$$\frac{A \times B \times C}{D \times E} = G,$$
or (5)
$$\frac{A \times B \times C}{D \times G} = E,$$
or (6)
$$\frac{20 \times A \times B}{D \times F} = G.$$

For Spiral Drives (Spiral Gears Within Transmission)

(7)
$$\frac{\mathbf{B} \times \mathbf{C} \times \mathbf{A}}{\mathbf{G}} = \mathbf{E}.$$

REVOLUTIONS PER MILE OF TIRES

30	in.		672.30
31	in.	*************	650.61
		•••••••••	630.28
33	in.	************************	611.18
34	in.	***************************************	593.20
35	in.	***************************************	576.25
36	in.	******************************	560.22
37	in.	*****************************	545.10
		***************************************	530.76
39	in.		517.15
40	£ 20		E04 99

FOR ALL CORD TIRES UP TO 33 IN. ADD ½ IN. TO TIRE DIAMETER. ALL CORD TIRES OVER 33 IN. ADD 1 IN. TO DIAMETER.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which semetimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

FOR ALL SOLID TIRES OVER 33 IN. SUBTRACT 1 IN. FROM DIAMETER.

The shafts on Stewart Warner speed-ometers rotate 1009 revolutions per mile, while on the A C speedometers the shafts rotate 1008 revolutions per mile. Accordingly the same calculations can be used for either type speedometer. If we assume that in the cases given the drive is from the front wheel we do not have to figure on the gear ratio and we can use formula No. 3 which is a simplified form of Nos. 1 or 2. Putting in the value of F which is 30, this being the size of the tire in inches, we have G equals

$$\frac{20 \text{ A}}{30 \text{ D}}$$
 or G equals $\frac{2/3 \text{ A}}{\text{D}}$.

If we then had a 1 to 1 ratio or direct drive we would need 2/3 as many teeth in the pinion as in the gear, and if we had 60 teeth in the gear we would have 40 in the pinion.

Swivel joints are available however, having the following ratio: 1 to 1, 2½ to 1, 3 to 1, 4 to 1, 6 to 1, 8 to 1, 12 to 1 and 16 to 1. If we should use a 2 to 1 swivel joint ratio and a 30 tooth gear we

would need a 10 tooth pinion.

Now taking the case of the same car but with the drive from the propeller shaft we find that instead of formula 3 we need formula 6. Then G equals

$$\frac{20 \times A \times B}{D \times F}$$
 or G equals $\frac{20 \times 3.77 \times A}{30 \times D}$ or

G equals
$$\frac{2.515 \times A}{D}$$
. We will now assume

that we use a 6 to 1 swivel joint ratio and substituting the value of 6 for D we

have G equals
$$\stackrel{2.515 \times A}{\longleftarrow}$$
 or G equals

 $.42 \times A$. Now if we assume that the gear A has 60 teeth we multiply 60 by .42 and find that the pinion required has 25 teeth.

In similar manner with a gear ratio in the rear axle of 3.63 we find that a 24 tooth pinion is needed and with a rear axle gear ratio of 3.9 a 26 tooth pinion is needed. The data given on the revolutions per mile of the tire for various size tires is used in formula 1, 2, 4 and 5 but is not needed in formulae 3 and 6, for the value of 1009 has cancelled with the figures having to do with the number of revolutions per mile.

WHY VALVE SEATS BURN WITH A COLD ENGINE

Q—A recent reply to one of your readers made the point that an engine operating at low temperature was prone to burn exhaust valves. Will you give explanation of this?—L. O. Grange, Minneapolis. Minn.

It is customary to set carbureter adjustment with engine hot. This means that when the engine is not up to its proper operating temperature that the fuel will not be properly heated and will accordingly not vaporize as well. Therefore the mixture which would be correct for the engine hot will be too lean with the engine running cool.

The nature of the combustion changes with the mixture. The energy of the fuel will show up either as heat or as expansive force which operates to drive the engine. When the mixture becomes too lean the combustion takes place in the form of a slow flame which produces a great deal of heat and not as much power as it should and the hot flame in passing out through the exhaust valves causes them to overheat, and the warping is the result of the excessive temperature.

You may be interested to know that the Motor Age subscriber in question was able to get perfect results by covering up a portion of the radiator and by other means seeing that the engine operated at a temperature of from 170 to 185 degs

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Garage With Washing and Greasing Racks

Q-Enclosed is a pencil sketch showing Q—Enclosed is a pencil sketch showing plot of ground upon which we contemplate building accessory and tire store, filling station, and a complete washing, greasing, and Simonizing service.

We think that a row of private or individual garages, on one side of the lot would be a paying proposition, as there is a demand for same in our location. We had in mind building the garages under one roof, but partitioning space for each

As to the washing, greasing and Simonizing racks, we would like to have built for both summer and winter use, and with every modern device and convenience.— Motor Supply Co., St. Joseph, Mo.

Plan number 527 will come about as near to fulfilling the conditions you give us as it is possible for us to figure out.

The gasoline filling station in front is designed to be modern and convenient in every respect and to bring gas customers in close contact with the accessory store. The washing, greasing and Simonizing departments are back of this with a limited space for the storage of cars which are waiting to be washed or greased.

The wash rack is designed to be similar to the one described in a recent issue of Motor Age and the greasing pit is simply long pits which will accommodate two large or possibly three small cars. These departments are all under one roof and the wash rack and greasing pits should be supplied with skylights, as

VERTICAL TLIDING DO GREASING SERV MOTOR AGE GARAGE PLAN 527 FOR MISSOURI DEALER 5 10

they are pretty far from any possible window light.

The private garages are made just wide enough to accommodate a car and we believe it would be best to use some

sort of a vertically opened door since the passage way is rather narrow, and if there were swinging doors opening into it, they would be bound to do more or less damage.

TESTING FOR CAM SHAFT KNOCK

Q-We have been having, and still have trouble with a hard to find knock in Chevrolet cars, Superior model, all 1923 cars. There is a sharp knock in the en-gine that appears after the cars have run anywhere from 700 to 1500 miles and there is one car in particular that is worse than the rest. This knock seems to be in the front of the motor. We thought We thought it was a timing gear knock, but on examining them, we find there is no back lash in the camshaft gears and the crankshaft

Could it be in the valve lifters or that cams become worn and allow the lifter to hang, and then slap on the cam and make a slight knock. We have examined the wrist pin and both rod and main bearing for looseness that would cause this knock, but they are all set up properly. I thought perhaps some other readers have had the same trouble and located it. In the meantime, I will keep on trying to find this knock and if I find it, I will let you know.-Walter S. Gibbons, Eureka, Mont.

From the information secured from the local Chevrolet service station we are told that a common source of knock in the models mentioned is due to worn camshaft bearings. It is impossible to short cut a camshaft bearing knock in the manner that a main or rod knock is detected but, to test for camshaft knock, put a large wrench on the rocker arm in the vicinity of each one of the main bearings, and keep the pressure downward so that the valve cam follower will have a steady pressure against the camshaft. This will prevent movement of the shaft up and down in its bearings.

To test for the No. 1 bearing either the inlet or exhaust rocker arm on No. 1 cylinder should be held down, for the center either valve on No. 2 or 3 cylinder and for the rear bearing either rocker arm on No. 4 cylinder. The Chevrolet service organization in this town also states that the No. 3 bearing is most often at fault. The remedies, in case you have traced the trouble to loose camshaft, is a new block, as the Chevrolet Company does not supply oversize camshafts.

A worn cam can be tested in the same manner, and also by the shim or thickness gage method, watching for varying clearance between the rocker arm and valve stem as the engine is turned slowly.

Architectural Service

Architectural Service

In giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor. Number of cars it is expected to garage. Number of men employed in repair shop. How much of an accessory department is anticipated.

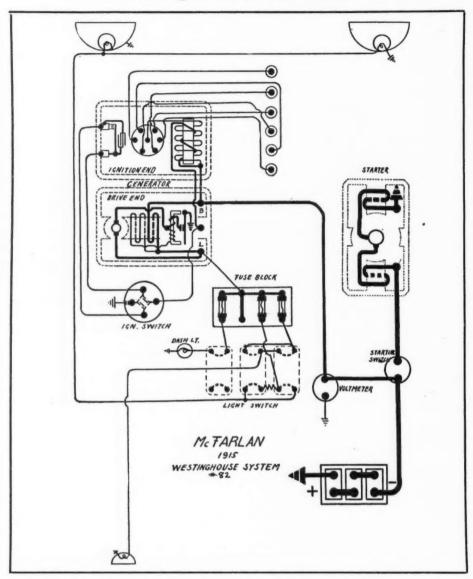
EFFECT OF REMOVING MAGNETS FROM A FORD

Q—We wish to install a Bosch ignition system on a Ford and take off the Ford magneto from the flywheel. We have magneto from the flywheel. We have machined a band to fit on the flywheel and it weighs eight pounds more than the Ford magneto. What difference will that much weight have on the running of the engine?—Walter L. Edwards, Dayton,

The magnets of the Ford magneto are used not only for generating current, but they also serve to splash oil around in the flywheel housing which then drains through a pipe to the front part of the engine. If you remove the magnets and make up for their weight by a plain steel rim you will find that the oiling is not taken care of properly. Probably the best thing to do is to take out the field coils and leave the magnets in place.

The lighter the flywheel the faster the car will pick up, but the more tendency there will be for it to jerk at very low speed. However, this speed is below any figure at which you normally wish to run. If you wish to take off both the magnets and the field coils it is not necessary to make up for the weight by means of a steel band. However, you should use double bronze spools on the bolts which normally hold the magnets and it is also well to put in some sort of an auxiliary oiling system which catches oil thrown off from the flywheel and sends it into the engine between cylinders 1 and 2.

Wiring of 1915 McFarlan



Q-Send wiring diagram for 1915 Mc-Farlan six, Model 76X.-L. L. Salle, Pyrites, N. Y.

Diagram in question is shown.

AS TO WHICH WAY THE SPARKS JUMP

Q-We notice on page 46 of the August 30th, 1923, issue of Motor Age, an article which states that the spark produced by battery ignition is always in the same direction, whereas that produced by the magneto is alternating in nature and therefore reverses its direction across the electrodes of the spark plugs.

Of course the magneto generates on alternating current, but I fail to see any reason why the spark at the plugs should also be alternating. It seems to me that the magneto armature is always in the same position for the same spark plugs and that therefore the spark at each plug bridges the gap in the same direction. For instance, if the spark at No. 1 cylinder jumps from the center electrode to the ground, it would jump from the ground to the center electrode on No. 3. In other words, the direction of the high tension current would be changed for every other plug, but would remain the same for each individual spark plug.

Advise whether my theory is correct or not.—A Reitz, Service Mgr. of Lipper Motor Car Co., Houston, Texas.

In the discussion to which you refer on page 46 of the August 30th issue we did not go into a great deal of detail as to the action of the magneto current. Your explanation, however, and understanding of the situation is correct. What we tried to bring out was the fact that current in either direction might be satisfactory as shown by the performance of magnetos over a period of years.

STOP

Turn to page 18 and find out what the Case Service Plan is and how it works.

EFFECT OF BEARING FIT ON THE

Q—In the issue of Sept. 13 on page 45 you print a question and answer headed "Will a Bad Bearing Score the Cylinder?" A bearing faulty in the way illustrated will have a tendency to make the piston stick for a reason which was evidently overlooked. The axis of the piston pin bearing must be parallel to the axis of the connecting rod bearing or the lateral movement of the connecting rod lower end will tip the piston in a crosswise position in the cylinder. The bearing illustrated would permit a slight rotation of the rod and piston assembly about the long axis of the connecting rod (axis of cylinder and piston), throwing the piston pin bearing out of line.—J. B. Hoffman, Kewanee, Ill.

In the sketch made to illustrate the question on page 45 of the Sept. 13 issue, it was somewhat difficult to show the contact exactly as intended. The intention was to have the contact shown at only two parts of the circumference, but extending the full length of the crank pin. With a bearing of this nature, of course, the connecting rod would not be thrown out of line, and the only result would be that the bearing would wear very rapidly.

Even if the bearing surface shown were at the side of the connecting rod toward us in the sketch, we doubt if the effect on the piston and cylinders would be serious. There would, of course, be a tendency to throw the piston against one cylinder wall more than againset the other, but this would doubtless quickly result in wearing down the babbitt so that the action would not take place for any great length of time.

A case of this kind illustrates two things. One is the need of carefully fitting bearings, and the other is the need of an aligning gage. Even if a bearing is not fitted perfectly, it will cause no trouble in misalignment of the rod if the rod is checked on a gage. This is due to the fact that any imperfection which would throw the rod out of line will also throw it out on the gage, so that the rod can be bent to correct for any slight mistake made in fitting the bearings.

EFFECT OF CHANGING TIRE SIZE

Q—What percentage on power will changing from 32x3½ to 33x5 tire have?

1—Approximately 3 per cent decrease.

2—On gasoline consumption?

2—This is impossible to figure accurately, but it should be born in mind that if the engine has surplus power that there will be a decrease in the gasoline consumption for the same mileage.

3-On speedometer speed reading?

3—A check on the speedometer speed reading can be calculated by reference to the formula given in the answer to the clearing of F. J. Herbst, Riverton, Minn. We are accordingly enclosing a copy of this answer with our letter to you.

4-On speedometer reading for distance covered?

4—The answer to this also can be ascertained by using the formula referred

Chemical Action in a Distributer Cap

Q—Can you tell us the cause of the following trouble just experienced on the Chevrolet 490? The metal on top of the distributer brush becomes corroded and full of soot, also the center carbon in the distributer cap gets black and burnt so that it requires cleaning once in a while, in order to run the car without missing.—Montana Subscriber.

1—We believe you are working on the wrong trail when you sandpaper the carbon button in the center of the distributer cap. This button under normal usage will become polished and glazed and if you sandpaper it you just wear away some of the carbon so that it will have to be replaced in a short time.

The Remy distributer used on this model Chevrolet has a distributer brush which does not make contact with the distributer pins which connect to the spark plug wires. However, the brush comes very close so that the spark can jump across a small gap. The spark in jumping inside the distributer cap produces a chemical action on account of the ozone which is liberated.

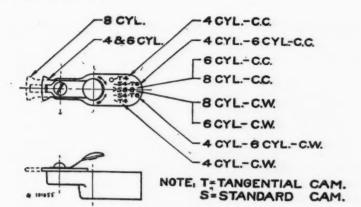
In working around an X-ray machine or any place where high voltage sparks are jumping you have probably noticed a peculiar odor in the atmosphere. This odor is also noticed sometimes during electric storms, due to lightning. It is produced by the oxygen in the air being split up into atoms. The chemical action produced tends to corrode metal very rapidly.

INSTALLATION OF GREASE CUP WILL KEEP TRANSMISSION OIL FROM REACHING THE DIFFERENTIAL

Q-We have a 1919 Overland model 4 which we have trouble with, the oil leaking out through the universal joint and down through the drive shaft housing to the differential case. How can this be stopped?-W. E. Frederick, Galesburg, Ill.

Referring to the illustration, you will note that at the extreme front end of the driveshaft there is a bushing mounted in the driveshaft housing or torque tube. The natural wear that takes place in this bushing causes the oil to flow back from the transmission into the differential. The remedy is to renew the bushing and in conjunction with renewing the bushing it is advisable to install a grease cup at this point which will not only tend to lubricate the driveshaft proper but will also maintain a film of grease to prevent oil from reaching the differential. Any authorized Overland service station can install the grease cup mentioned.





Under normal circumstances the extent of this action is very slight but if the distributer arm does not bring the brush very close to the pin when the spark occurs, this action may be considerable. We assume that the trouble you are experiencing is due to having a distributer arm which is not properly drilled.

The illustration given shows a Remy distributer arm on which there are a number of marks. It also shows where the holes should be drilled, depending on the distributer, whether it is a four cylinder, six cylinder or an eight cylinder and whether it is for clockwise or

counter clockwise rotation. Rotation is always considered as looking down on the distributer with the cap removed. On the cam on the distributer shaft there is a pin which goes up to the hole which is drilled in the distributer arm and this locates the arm correctly with respect to the cam.

It is, of course, possible to check the distributer arm location by turning it in the normal direction until the cam is just ready to open the contacts and then see if the distributer brush is in line with one of the pins in the distributer can.

ORIGINAL TYPE BEARINGS USUALLY MOST SUITABLE

Q—Can we use rod bearings for an Oakland 34C made of bronze containing 40% lead, without a babbitt face? This car gets considerable hard driving and the babbitt bearings are not holding up very well.

1—If the crankshaft is true on all journal and crank pin faces and not sprung, there is no reason why the regular Oakland bearings should not give satisfaction under the most extreme driving conditions. We would, therefore, advise against the use of a bronze bearing bushing. If the car is put to unusually severe service, it might be advisable to increase the oil pressure about 40%.

2—Would it be inadvisable to plane off 1/16 or 3/32 inch from the top of the cylinders? This engine has never had a fuel knock. We want more power.

2-It will be possible to remove some material from the cylinder head but we cannot understand your statement that the engine has never had a fuel knock, as these engines, when first brought out, were susceptible to knocking from too high compression. Don't remove more than 1/16 at the first setting, as you may find that even this amount will produce a bumping when there is any slight amount of carbon in the combustion chamber. If you want more power, it would be well to experiment along carburetion lines, using different carbureters or different settings in the present carbureter. If speed is not a necessity, there will be a decided gain in the power if you raise the gear ratio.

3—Can we get alloy pistons of the constant clearance type for this engine?— Electric Battery Service, East Liverpool, Ohio. 3—Yes. Constant clearance aluminum pistons can be secured from the Oakland Motor Car Co. direct, or from any of the replacement piston manufacturers, advertising in Motor Age.

FITTING FORD PISTONS

Q—I would like you to describe the installation of Ford pistons.—W. Constable, Willowdale P. O., Ontario, Canada.

1—The fitting of Ford pistons does not differ appreciably from the fitting of pistons on any other car. If the cylinders are scored or tapered or out of round, they should be brought to a truly cylindrical shape before new pistons are fitted. This can be done by regrinding, reboring or by lapping the cylinders larger with one of the lapping machines on the market or with an old piston and lapping compound.

The new pistons should have a clearance of from .003 to .004 and after the engine is finished the car should be run very carefully for the first 500 miles. The clearance may be checked with a thickness gage and it should be possible to push the piston through the cylinder without a great deal of effort with the .004 gage between the piston and the cylinder wall.

What do you know about testing and overhauling magnetos?

BILL FIXIT

has something to say on the subject, this week, on page 23.

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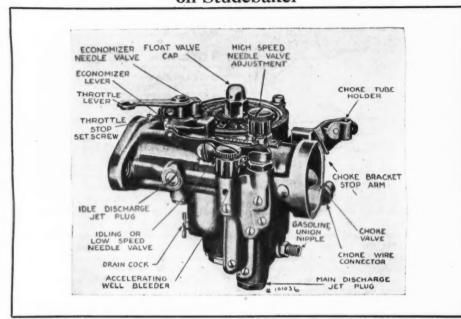
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Specifications for Stromberg Carbureter on Studebaker



Q—I am having some trouble with a Studebaker four 1920 model that I do not understand. The trouble is, when you open the throttle quickly, it will spit back through the carbureter and also will do this on a hard pull, but will run smooth on a level. The carbureter is a Stromberg and I have tried a new one and it does the same way. I have also checked the ignition and find it all O. K. It will do this regardless of where you set the high speed adjusting screw. Could this trouble be in the valves? If so, could you remedy it, although I have ground the valves and installed new rings?—N. C. Subscriber.

According to records in this office and the Stromberg Carbureter Company plant the Studebaker 4 was discontinued in 1920, consequently the last model built was during 1919. We are assuming that although you have tried a new carbureter the outfit was not exactly suited to the engine and are herewith supplying you with the internal specifications which you should check against the present carbureter, especially the items concerning the main jet and the accelerator well

size. The following are the specifica-

Model O E 2 carbureter with a %-in. venturi.

Main discharge jet A 34 B 18.

No. 30 accelerator well orifice. No. 56 economizer needle with a 5/16-in lift

No. 54 accelerating nozzle.

No. 52 idling discharge jet.

No. 42 economizer reducer.

By referring to the cut you will be enabled to find the location of the parts mentioned.

If the carbureter which you have at present installed on the engine checks up with the specifications given, we would advise that you examine the valve timing and check the valve tappet clearance so as to be sure to have not less than .004 on inlet and exhaust. If the timing and carbureter appear O. K. after examination it would be well to try a new set of plugs setting the electrodes about .020 of an inch apart.

to 15 or 20, may account for the overheating.

It is also possible that at some time the bearings have worn so that the armature has been allowed to rub on the pole pieces. This may short circuit the laminations in the armature so that eddy currents in the iron core cause the armature to overheat.

In checking the main brush position with the third brush lifted and battery current connected to the main brushes, there should be practically no tendency for the armature to rotate. It is sometimes considered permissible to have a slight tendency to rotate in the normal direction.

Another possible source of trouble is a poor connection inside of the generator between the live brush and the terminal, which allows the armature to operate at high voltage. You can check this by having the generator charging the battery, and while it is doing so, connect a voltmeter to the two main brushes. The voltage here should be only .2 or .3 volts greater than at the battery.

To determine whether the armature is dragging on the poles, it is well to send battery current through the field, winding only while trying to turn the armature by hand. The armature will always turn with greater difficulty under these circumstances, and if there is a drag of any sort, you will be able to feel it, where, in certain position of the armature, it will turn harder than in other positions.

An illustration of the No. 760 Westinghouse generator as used on Dort cars is shown, the sketch at the right showing the generator with the cutout mounted inside, while the sketch at the left shows the cutout eliminated from the generator and used outside.

2—Give the proper distance for the magnetic gap in different types of magnetoes, also the speed, so that we may be sure they are O. K.

2—Practically any high tension magneto should give a spark which will jump 3/16 of an inch when the armature is given a quick turn by hand. Generally the interrupter contacts should open when the armature or inductor is just leaving the pole piece, so that there is a gap of about 1/32 inch. On Dixie magnetoes it is possible to have this same

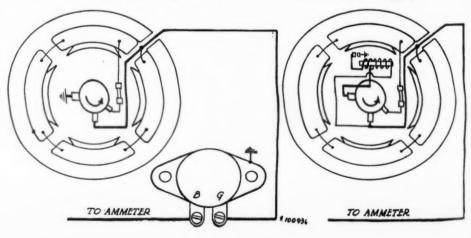
(Continued on next page)

ANOTHER GENERATOR GETS HOT UNDER THE COLLAR

Q—We are having trouble with a No. 760 Westinghouse generator, used on a Dort car. The generator overheats. We have checked this machine by lifting the third brush to test the main brush position, and have also tested it as a motor and find that it runs freely. The brushes do not spark and we have tried another armature, but it still overheats. We also took out the field coils, dried them out thoroughly and coated with shellac, but it still overheats. What is the cause of this condition?

1—It is not likely that there is any trouble in the shunt field unless you can see that it has been burnt. The shunt field, when connected directly to a 6-volt battery, should draw about 3 amperes. The field current, when operating normally, however, will be less than this, for with the third brush connection it is not connected to 6 volts.

You do not mention the charging current; this should be in the neighborhood of 10 or 12 amperes, and if it goes up



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Slipping Clutch May Require New Friction Discs

Q—How do you stop a clutch from slipping on a model J Hudson Super Six? We have flushed it out three times, putting in the proper mixture of oil and kerosene, and even used all kerosene, and then it would slip for a few turns and then grab very hard. The pedal does not need adjusting for it does not touch the floorboard. Would also like to know how to remove the clutch and replace the discs.

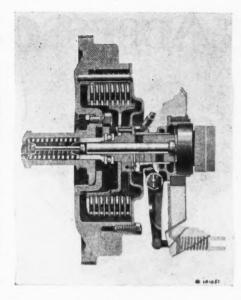
1—The last part of your question is probably the solution of the first part. The cork inserts are doubtless worn down so that they no longer function to enable the clutch to take hold easily. The rest of the lining is also probably glazed so that it either slips or grabs. This, of course, means that new discs are required.

To remove the clutch, first take up the floor board and then loosen the rear universal joint at the axle, pulling the propeller shaft out of the splined shaft joint at the transmission. Disconnect the starter connection and the front end of the brake rods. Loosen the screws which hold the transmission to the engine crankcase and put a block under the transmission or else have a helper under the car to assist in moving it backward. Pry the transmission loose and back, and then remove the screws holding it to the engine. Drop the transmission to the floor.

There are from 20 to 30 screws holding the clutch to flywheel. Take out all but four of these, leaving the four at 90-degree intervals around the circumference. Then loosen the four screws, a turn at a time, to ease off the pressure on the clutch spring. When these four screws have been loosened all the way, the clutch will come out.

2—Explain how to remove the clutch on an Essex.

2—The process is the same as on a Hudson except that the clutch screws are removed first, leaving four of them in place at 90 degree intervals. These are then loosened, a turn at a time, as



was done in the case of the Hudson. After the clutch screws are removed, the screws holding the transmission case are loosened and the transmission is worked backward. The screws are then taken out and the transmission is lowered to the floor. In both cases, that is on the Hudson and the Essex, care should be taken that the weight of the transmission does not hang on the supporting screws after they have been loosened.

3—What are the steps to be taken in overhauling a Dodge disc clutch and show a picture if possible?

3—A sectional view of the Dodge clutch and transmission were shown on page 44 of the August 9, 1923, issue of Motor Age. First remove the floorboard and clutch hand hole inspection cover. Disconnect foot brake and hand brake pull rods, clutch release bearing tube and speed-ometer cable. Remove accelerator pedal and bracket. Disconnect and pull rear axle assembly. Remove wires from the spark plugs and manifold. Remove bolts from manifold and cotter pin from rear end of exhaust pipe. Remove manifold and exhaust pipe. Remove rear motor

support bolts and place jack under motor. Remove transmission cover assembly and transmission assembly. Remove clutch assembly for replacement of parts, cleaning and general overhaul.

Assemble clutch assembly and install. Assemble transmission and remove jack from under motor. Assemble exhaust pipe and manifold. Connect wires to manifold and spark plugs. Tighten clutch release housing supports. Connect speedometer cable and clutch release bearing grease tube. Assemble accelerator pedal and bracket. Assemble and connect rear axle assembly. Assemble transmission cover and control assembly. Connect foot and hand brake pull rods. Assemble clutch hand hole cover and floorboard.

4—We have a 1917 model J Super Six Hudson car which misses at high speed. What is the reason?

4—One possibility is that the spark is weak at high speed. This may be due to burnt condition of the contacts, too wide a setting of the interrupter contacts, or to too weak a spring on the interrupter arm. You can check this condition by removing a wire from a spark plug and holding it within 3/16 in. of the engine. Then race the engine and see if at high speed the sparks miss occasionally.

If trouble is not in the ignition it is probably in the carbureter and may be due to the piston sticking and failing to rise and giving an increased flow of gasoline to the mixture at high speed. This may be checked by pulling the piston out and cleaning it off with gasoline and then replacing and lubricating with a slight amount of kerosene.

5—Is the Model M Samson tractor still made?

5—No. The plant where it was formerly made at Janesville, Wis., is now devoted to the production of Chevrolet

6—Give name of company which makes fibre timing gears for Ace four cylinder metorcycle.

6—You will find in the Motor Age advertisements concerns making silent timing gears. Any of these will probably furnish the gear you require.

7—Explain and describe the vibration damper used on the Packard Single 6.

7—The general principle is that of a small flywheel, located at the front of the engine, but not rigidly connected or keyed to the crankshaft. It is, however, driven by friction from the crankshaft in such a manner that a slight amount of slipping is possible. The construction involves the use of springs and friction material but no exact illustrated drawing is available.

8-What is the speed of the Packard single 8, of the single 6, of the new Dodge, and of the 1924 model Buick

8—The Packard single 8 will do about 75 m.p.h. while the single 6 will do 60. The Dodge will do from 45 to 55 m.p.h. and the 1924 Buick will do 65 to 70.

and the 1924 Bulck will do 65 to 70.

9—What size valves are used on the Henderson DeLuxe motorcycle?—O. B. Law. Indianola, Iowa.

9—The diameter of the head is 1 7/16 in. The over-all length is $4\frac{1}{6}$ in. and the diameter of the stem is 5/16 in.

(Continued from preceding page)

gap at all positions of the retard and advance. On other magnetoes, such as Bosch or Eisemann, the most advantageous position is usually obtained in the advanced position of the interrupter.

When retarding the spark the gap is somewhat greater at the time the interrupter contacts separate and the spark is accordingly slightly weaker. This accounts for the fact that a magneto equipped car will often start easier if the spark is advanced, although in doing so it is necessary to spin the engine to keep it from kicking back.

3—Give the proper test for Simms-Huff generator when checked up on a test bench. Advise how to test the relay.— Oregon Electrician.

3—Internal circuits of the 6 brush and 5 brush Simms-Huff motor generators were given in the September 13, 1923, issue of Motor Age. In this illustration the machine at the left is shown with

shunt field grounded and the other end of the shunt field coming out of the machine. Normally, when connected on the car, these two wires are connected by means of the contacts in the regulator being closed, but when checked up on a test bench, it is necessary to connect these two terminals together in order to have shunt field current. It then operates as a straight shunt machine.

To test the combination regulator and cutout, it should be connected with the armature terminal, which is marked No. 2, to the connection to the live or insulated brush. The No. 3 or field connection on the relay should go to the field connection on the generator, the battery connection on the relay should go to battery and the ground connection should be grounded. The terminal marked Dyn. minus is the one that should be grounded to the frame of the motor generator when testing.

BOOSTING ACCESSORY SALES

A CCESSORY displays in shows all over the country will occupy a much more prominent place this season than in the past. This action on the part of accessory manufacturers and show managers is a splendid indication of the increased interest in accessories on the part of the buying public. There was a time when to make an "extra equipment" sale at the same time the car was sold, was considered quite a feat by dealers but that time is past.

Scarcely any buyer of a car, new or used, would think of driving that car without first fitting it with bumpers, a spare tire, spotlight, stop light, parking lights and many other fitments if they are not included with the car itself. The past year has brought out many new and useful equipment for the car and these are sought by car owners, eagerly. The idea of an electric cigar lighter would have met with little approval a few years back but today you will find a great number of them in use.

The same is true of many other accessories and parts. 1924 will undoubtedly have its many new adornments and the dealer who sells accessories will find a ready market for anything that is really of use to the car owner. There are, too, a number of ornamental fixtures to be used for beauty's sake. Few of these, however, are simply ornamental —many combine some needed feature.

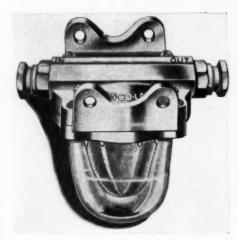
Imagine selling a vanity case to a car owner five years ago? It would have been laughed at by the purchaser but to-day with so many women drivers, it has become a necessity and few cars which are used by women, are without them. There are many "little things" such as the ones mentioned here, that, while they are not absolutely necessary to the operation of a car, will add greatly to the comfort and convenience of that car.

When you sell such accessories to a car owner, they are bound to enjoy their car that much more and consequently will become more attached to it. It is to your own advantage in more ways than one, to sell accessories.

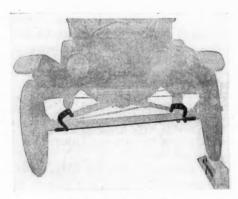
The Bassick Manufacturing Company announces the Alemite Gas-Co-Lator, to add to the list of other Alemite products. This Gas-Co-Lator, is a gasoline filter, to be used in the fuel line between the gasoline tank and carbureter for filtering dirt and water out of the fuel supply.

In the majority of vacuum tank systems, the Gas-Co-Lator is fitted to the intake of the vacuum tank and the line from the main tank attached to the Gas-Co-Lator. In pressure and gravity feed systems, the Gas-Co-Lator is inserted in the gas line between the main tank and the carbureter.

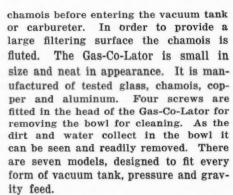
The action of the Gas-Co-Lator is simple. The fuel enters a heavy glass bowl and is filtered upward through selected



Alemite Gas-Co-Lator



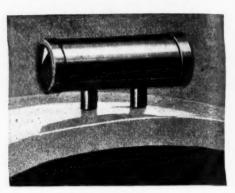
Nash shock equalizer



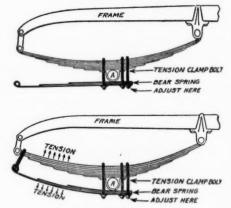
The Star Rubber Co. of Akron has brought out a new all-rubber Tire Protector Flap for which the following advantages are claimed by the manufacturer: it does not deteriorate from the action of water or grit; it does not rust from contact with the rim; it acts as a gasket or insulator to keep the inside of the tire dry.

The Nash Shock Equalizer is sold by the Apex Auto Accessories Co., 415 Chestnut street, St. Louis, Mo. It is designed for the Ford car and attaches as shown in the cut. It can be installed in a short time without changing Ford design or construction. It sells for \$10.

O. A. Moldenhauer, 1447 Buffum street, Milwaukee, Wis., has brought out the O. M. Accelerator, with which the company



Potter signal lamp



Bear leaf springs

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has been experimenting for some time and which it declares adds greatly to the efficiency and driving comfort of the

The Columbus Varnish Co., Columbus, O., has added the Peerless Khaki Top Dressing to its line of automobile specialties. This is a dressing to be applied to both the inside and outside of khaki tops. It does not wash out and leaves the top soft and pliable. It also has waterproofing qualities.

Bear Leaf Springs are made by the Bear Mfg. Co., Rock Island, Ill. The cut illustrates the application of Bear springs to cars having standard elliptic type springs, the upper cut showing the assembly at the axle. The lower cut illustrates the complete assembly and the arrows indicate the tension on Bear springs which is just the reverse of the car spring. The price of four springs complete is \$16.

The Potter Signal Lamp is the product of the W. F. Potter Mfg. Co., Elmira, N. Y. It is installed, as shown, on the left front fender of the car and is equipped with a yellow and green lens, the yellow to the rear and the green to the front. This lamp is designed especially for driving in congested areas where drivers of cars behind have difficulty in passing cars that are not so lighted.

GETTING MORE OUT of the SHOP



Hisey two-wheel floor and bench grinder



U. S. Automatic portable electric drill



Stevens timing tester

CHICAGO'S Closed Car Show opened to a "fair" attendance and that because of a particularly bad day, but the second day of the show told another story. People fairly thronged to the Coliseum to view the new closed models of the many cars and a number of sales were reported. Not uncommon was the expression, "I shall want delivery on my car when snow flies" and this means but one thing—more business for the shop during the cold weather.

Not only in Chicago is this true but in virtually every community in the country, automobiles will be used every day. If you are prepared to meet the demand that is going to be made on your shop, you will find no reason to complain of dull days and the like.

If you are ready to repair cars and do it quickly, efficiently and at reasonable cost, you will be able to keep busy all winter. You will need, however, the equipment to turn out quick, good work, because the driver of a car will want that car all the time.

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Before you install any new equipment be sure that that equipment measures up to standard and will perform for you. Do not experiment with uncertainties—winter work requires too much in the way of positive working results to invest in anything in tools that will not do the work.

You will require brighter and cleaner working quarters and an investment at this time in better lighting for the shop will not be regretted. At least, wash the windows—that will permit of a lit-

tle better light, anyway. Keep the shop warm, too if you would get the best work out of the men. No man can do fine work on anything when his fingers are numbed and his whole body uncomfortable.

It means just a little more than the ordinary care in opening and closing the doors and in keeping the heater at the right temperature. Don't expect a man to lay on a cold floor for hours working without needing a week off to recover from colds in the head. If you have a rack, you will find that the work he does is much better because he will have better light and will not tire so easily.

It is surprising how many shops that still do business are so totally lacking in the really necessary things. There is but one answer: the number of alley shops has been reduced to less than half of what it was two years ago and the process of elimination has just begun to work.

The capacity of the U. S. Automatic Portable Electric Drill is ¼ inch in steel. The handle is cast integral with the aluminum body and is located at the extreme top of the grip. The motor is universal and the armature is mounted on S. K. F. ball bearings. The gears are chrome nickel steel, hardened and run in grease. It is complete with eight feet of rubber covered cable and a one piece swivel attachment plug. The weight is five and ¾ lbs., and the size is 10 by 4 inches. It can be fitted with a bench base and arbor and wheel to turn it into

a grinder and it can also be mounted in a drawing stand or post bracket to form a bench drill or bracket drill respectively. U. S. Electrical Tool Co., Cincinnati, Ohio.

Laminated Shim Company of Long Island City, N. Y., has introduced a very useful and convenient method for stocking and handling laminated shims, known as the Laminum-Kit for car dealers. This Kit is an all-steel compartment box containing an assortment of 250 shims for one particular make of car. For instance, the dealer in Dodge cars buys the Dodge Kit: the Chevrolet dealer a Chevrolet Kit and so on including all popular makes. The many advantages of this Kit for car dealers is immediately apparent. The dealer's service department has in stock exactly the shims needed for its own work.

The Hisey-Wolf Machine Co., Cincinnati, O., announces many changes in the complete line of Hisey Two Wheel Floor and Bench Grinders. Floor stand grinders are made in seven sizes from 1/2 to 10 hp. A few of the noteworthy features of the Hisey line are full safety motor starter which gives maximum production to the motor while starting and when in operation; cone shaped heads which permit maximum working space around grinding wheels; spindles and ball bearings of extra large size; liberal wheel spacing, sufficient for two operators; full safety enclosed and adjustable wheel guards which can be furnished for all grinders. The cut shows the floor grinder, 1/2 and one hp. size.

A-Mal-Gam is the product of Smith's Inventions, Inc., 2619 Fourth street, S. E. Minneapolis, and is used for welding cast iron and bronze. The manufacturers claim that preheating, in many cases, is not necessary and that in no case where A-Mal-Gam is used is it necessary to bring the job of welding to a red heat before using it.

The Air-Lec Door Swing is made by the Schoelkopf Mfg. Co., Madison, Wis. At the touch of a button, it opens and closes the largest doors, by compressed air. It is designed to be operated from the tire filling tank. The price, complete, two-inch cylinders is \$100. The cut shows the doors fully open, looking down.

Remember to select your equipment carefully and with an eye to what your customers' requirements will be. There are many so-called "little things" which are indispensable to the well-equipped shop. You will find that if you cannot do the work that your customers will find that your customers will find someone who can and an inspection of that "someone's" shop will disclose a better, neater, more efficient place,

COMING MOTOR EVENTS

AUTOMOBILE SHOWS
Albuquerque, N. MU. S. Good Roads Assn. and Show
BaltimoreAnnual Automobile ShowJan. 19-2 Brooklyn, N. YAnnual Automobile ShowJan. 19-2
Chicago National Automobile Show Jan. 26-Feb. Chicago Good Roads Show. Jan. 14-6 Chicago Chicago Closed Car Show, Coliseum Oct. 13-2 Chicago Annual Salon, Drake Hotel Jan. 26-Feb. Cincinnati Third Annual Accessory and Radio Show Nov. 17-2 Cincinnati Eighteenth Annual Automobile Show Februar Columbus, Ga. Automobile Show Oct. 15-2
Dallas, Texas Annual Fall Show Oct. 13-2 Dallas, Texas Annual Automobile Show Feb. 11-1 Danbury, Conn. Automobile Show in Conjunction with Des Moines Annual Automobile Show. Feb. 25-March
Louisville, KyAutomobile Show at the Jefferson County ArmoryFeb. 18-2
New York
Waco, Texas

Washington, D. CAnnual Fall Closed Car and Accessory
Washington, D. C. Annual Fall Automobile Show Oct. 20-Nov. 5
FOREIGN SHOWS
Buenos Aires Annual Automobile Exposition. Nov. 1-15 London Motor Car Exposition. Nov. 2-10 Paris Tractor Show at Grand Palais Oct. 24-Nov. 2
RACES
Berkeley, Calif. Thanksgiving Danbury, Conn. Oct. 20 Hartford, Conn. Oct. 27 Los Angeles Nov. 29 Oakland, Calif. Nov. 1
CONVENTIONS
ChicagoExhibit and Convention of Automotive Equipment AssociationNov. 12-17
Cleveland, O. Society of Automotive Engineers Production Meeting October
Cleveland, OThirtieth Annual Convention, National Assn. of Farm Equipment ManufacturersOct. 24-26
Columbus, O
Detroit S. A. E. Annual Meeting Jan. 22-25 New York National Tire Dealers' Assn. Convention Nov. 13-15

QUEEKS & RA

Oh, Where, Oh, Where Can He Be?

By "Kay Em" Roberts Oh, where is the man who can truthfully shout, that his friends and his brethren may hear, "I am honest and true and there's never a doubt that I'm openly frank and sincere." There are plenty of those who proclaim to the throng of their virtues, one hundred per cent, but it keeps a guy guessing while plodding one hundred per cent, but it keeps a guy guessing while plodding along, to keep tabs on that kind of a gent. Some duffer may warble and blow his bazoo, "I'm an angel dressed up in disguise," at the time he is throwing the hooks into you, with a mantle of wool on your eyes. Oh, beware of the bird with a flivver to sell when he tells you, "It's A, No. 1", tho his word may be true you can never quite tell 'till you've heard the old coffee mill run. Take a squint, first at this, then at that and at these, and be sure for yourself that it's there, then perhaps you wan't hite on an old piece of cheese that may soon make you won't bite on an old piece of cheese that may soon make you grumble and swear. You've a mind of your own that was put there to use when occasion arises, perchance, so that slickers and sharks won't run off with your shoes or go south with your one pair of pants. It's a dandy idea to lay trust in all men, if it only worked out as we wish, but just try it—you'll find that, again and again, you've been hooked—and you're always a fish.

Help! Help! An Improved Lizzie

One flivver owner installed a carbureter that was guaranteed to save 20 per cent on fuel. Then he put in special spark plugs that were guaranteed to save 20 per cent. Then he added an intake superheater that was guaranteed to save 20 per cent. He next added a special rear axle that was also guaranteed to save 20 per cent. He put on high-pressure "cords" that promised a 20 per cent saving! 20 per cent saving!

And now, with a fuel economy of 120 per cent, he has to stop every hundred miles and bail fuel out of the gas tank to keep it from running over! Honest!!

-Tripoli Tattler. Help! Help!

The Used Car Problem Solved At Last

A story contributed to one of our contemporaries and award-A story contributed to one of our contemporaries and awarded 2nd prize contains the following recommendation made to a customer, "If you have any trouble bring your car in to us and we will put an end to it."—HAP.

Helpi Helpi

Where, Oh Where, Is the Alley Gang?

Used Cars Again

Trade 'em right, get 'em in shape to sell. Don't let them stand around the shop—it will seem too much like home to them if you do."—Kerry Sene Sirkut.

Even the Best Fall Now and Then

An applicant had just sold himself to the foreman as one of the very best mechanics in the business and that all makes of cars looked alike to him.

He was assigned to a valve job on an Essex. busy for a while, then slipped over to one of the bench workers and asked in a stage whisper:

"How the hell does that engine run with only four valves?"

Help! Help!

Striking Affair

They met on the road at midnight, They'll never meet again, One was a southbound flivver The other, a westbound train.

-JINX.

Help! Help!

Now He Eats

Tom O'Brien, assistant sales manager for Olds and something of an after dinner speaker tells this one on himself:
"I used to take my speaking efforts very seriously and eat very lightly at a dinner after which I was to be one of the

entertainers or instructors. But no more.

"One night in Boston an elegant shore dinner was served and I ate very little. My table neighbor asked if I did not like shore dinners, so I confessed a weakness for them but told him

"After my talk, I turned to this neighbor and asked:
"'How did it get over?'
"'Well,' said the New Englander, 'I believe that you might as well have et?'"

Help! Help! THE WORLD'S SERIES is now on and probably will be off by the time this is printed but that wont stop some inspired press agent from sending out a story declaring that the hero, whoever he proves to be, attributes his success to the fact that he drives the kind of car that said p. a. is boosting.

Help! Help!

WORLD'S SERIES and prize fights are terrible things-no ur no no and reading, "Our gas saving device manufacturer can print an ad reading, "Our gadget won the affair—it gave the victor the necessary stamina to bring home the bacon."

Help! Help! NOR DO world's series games provide much in an automotive way to do the time honored stunt of filling space, therefore, we repeat, "Help! Help!" LEW BRICATION.

Current Motor Truck Specifications (This list comprises trucks distributed on a national basis)

			ENG	INE			REAR	AXLE	, TI	RES			1	ENG	INE		1	REAR	XLE	TI	RES
MAKE AND MODEL	Tons Capacity	Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	MAKE AND MODEL	Tens Capacity	Price	Make & Model	Bore & Stroke§	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
Acme	1-11/2 11/2-2 21/2-3 31-41	\$4950	Co-L4 Co-B5 Own	4½x5½ 4¾x6 4¼x6	B&B. B&B. B&B. B&B. B&B.	Cot Cot Own.	Ti-6660 Ti-6760	WO. WO. WO. WO. WO. WO.	34x5n 34x3½ 34x3½ 36x4 36x5 36x6 36x5 36x6	34x5n 34x5 34x5 36x7 40x10 40x12 36x5 40x6	Dert. 109 Double Dr. DFT Duplex. G Duplex. GH Duplex. AA Duplex. AC Duplex. E	3 1 11/2	4000	Bu-WTU Bu-WTU Hi-400 Hi-400	33/4 x51/8	Cov Cov B-L	Own. Own. B-L Cov Cov B-L B-L.	Fl-105 Own Ti-5511 Sh-1501 Sh-103 Vu-4 Own	SB WO SB WO WO WO IG	31x4n 36x6 33x5 35x5 35x5 35x5n 34x5 36x8	31x4n 36x6 33x5n 36x6 38x7n 36x8 36x8
Armleder 21 Armleder HWB Armleder HWC Armleder KWB Armleder KWC Armleder KWC Allas 25 Allas 40 Atterbury 22C Atterbury 22D Atterbury 22D Atterbury 22D Atterbury 22D	1223331443234 223331443234 1112336 1112336 1112336	1495 1950 2475 †3375b †4275b †4975b 2200†	Bu-GTU Bu-HTU Co-C4 Bu-YTU Co-E4 Bu-WTU Bu-WTU Co-K4 Co-K4 Co-L4 Co-B2 Own	334x514 414x512 418x514 412x6 412x512 334x518 334x518 334x514 412x512 418x514 412x6 434x412	Ful B-L B-L B-L B-L B&B B&B B-L B-L B-L B-L	Ful B-L B-L B-L Own. Own. Ful B-L B-L Own.	Ti-6460. Ti-6560. Ti-6560. Ti-6666. Own. Own. Ti-6460. Ti-6560. Ti-6760. Own.	WO WO WO WO WO WO WO WO WO	34x3½k 36x4k 36x5k 36x5k 36x5k 34x4½m 36x6n 34x4k 36x4k 36x5 36x6 34x4	40x6 34x6k 36x4dk 36x5dk 36x5dk 36x5dk 34x4½n 36x6n 34x6k 36x4d 40x6d 40x7d 34x6	FordTT	1½ 2½ 4 6 1 1½ 2½ 3½-4	4200 3000 3900 5000 5700 370 2800	Wi-A Wa-CT Wa-CU Wa-DU Co-J4 Co-K4 Co-L4 Co-L4 Co-B5 Own Bu-CTU.	41/2x51/4 41/2x51/2 43/4x6 33/4x4	B-L. B-L. B-L. B-L. B&B. B&B. B&B. B&B. B&B.	Own.	Own Ti-6461 Ti-6560 Ti-6666 Ti-6760 Ti-6252 Ti-6252 Ti-6560 Ti-6660 Ti-6760 Own		36x6 34x3½ 34x4k 36x5 36x6 33x5n 34x5nk 36x4 36x5 36x6 30x3½ 36x5	36x6 34x6 36x7 36x5d 40x6d 33x5n 36x6nk 36x8 40x5d 40x6d 32x41/4 36x4
Autocar	1-6 11/2 21/2 31/2 5	3100† 4200† 2450 3160 4175 5375	Own Own He-O He-CU3. He-MU3 He-T3 Own	4x5½ 4¼x5½ 4x5 4x5 4x5½ 4½x5½ 5x6 3x4	Own.	Own. Own. B-L. B-L. B-L. Own.	Own Own Ti-6460 Ti-6560 Ti-6666 Ti-6760 To-OX2.	DR WO WO WO WO IG	34x5 34x6 36x3½ 36x4 36x5 36x6 34x5n	36x8 36x12 36x5 36x8 40x5d 40x12 34x5n	G.M.C K16 G.M.C K41 ††G.M.C K41 G.M.C K71 ††G.M.C K71 G.M.C K101	1 2 2 31/4	1295 2375 2450 3600 3700 3950 4050	Own Own Own Own Own	3½x5½ 4x5½ 4x5½ 4½x6 4½x6 4½x6	Own. Own. Own. Own. Own. Own.	Own. Own. Own. Own. Own. Own. Own.	Own Ti-6560 Ti-6560 Ti-6666 Ti-6760 Ti-6760	SB WO WO WO WO	34x5n 36x4 36x4 36x5 36x5 36x5 36x5	34x5n 36x7 36x8 40x5d 40x12 40x6d 40x14
Bessemer	212	1450 1995 2895 3495 1385 2185 2985	Co-C2 Co-E7 Own	1\2x5\2 3\2x5 4x5\4 4x5\4 4x5 4x5 4x5 4x5 4\8x5\4	B&B. B&B. B&B. B&B. Ful. B-L. B-L. B-L. B-L.	Ful Bak B-L Det Det Ful B-L B-L B-L B-L B-L Own .	To-A LM-7150 LM-7250 To-E Ea-1000 Wi-60A Wi-88E Co-52001 Ti-6460 Ti-6666 Ti-6666 Ti-6760 Own	DR IG SB DR DR	35x5n 36x3½ 36x4 36x5 35x5n 34x4 36x4 33x5n 36x4 36x4 36x4 36x6 31x4n	35x5n 36x5 36x4d 36x10 35x5n 34x6 36x8 33x5n 36x6 36x8 36x8 36x5d 40x7d 31x4n	Garford 15 Garford 25B Garford 70H Garford 71D Garford 68D Garford 150A Gary F Gary J Gary J Gary J Gary K Gary K Gary K Gary S Graham Bros BD	1 11/2 21/2 4 5 71/2 1 2 21/3 31/4	1590 2375 3250 4200 5000 5750 1775 2450 2850 3790 4450 1265	Bu-MU	35 2x5 1/3 33 4x5 1/8 4 1/4x5 1/2 4 1/2x6 5x6 1/2 33 4x5 1/8 4x5 1/4 4 1/2x6 4 1/2x6 5x6 1/2	B&B. Own.	Own. Own. Own. Own. Own. Ful. Ful. Ful. B-L. Dod.	Ti-6250 Ti-6460 Ti-6560 Ti-6666 Ti-6760 Own Ti-6352 Ti-6460 Ti-6560 Ti-6560 Ti-6760 Own	WO WO WO Ch WO WO WO WO WO SB	34x5n 36x3½ 36x4 36x5 36x6 36x6 36x3½ 36x3½ 36x4 36x6n 36x5 36x6 33x4½	34x5n 36x5 36x8 36x5d 40x6d 40x7d 36x5 36x7 36x8 40x8n 40x10 40x12
Clydesdale6 Clydesdale4 Clydesdale2	1 (See S 11/4 21/2 31/2 5 6-7	550 chwart	Own z) Co-N Co-K4 Co-L4 Co-B5	3 ³ / ₄ x5 4 ¹ / ₈ x5 ¹ / ₄ 4 ¹ / ₂ x5 ¹ / ₂ 4 ³ / ₄ x6 4 ³ / ₄ x6	Own. B&B. B-L.	Own. Own. Mun. B-L. B-L. B-L. B-L.	To-C139. Own Own Ti-5511. Ti-6460. Ti-6666. Ti-6760. Sa-D16.	SB SB WO WO WO WO SB	36x6n 30x3½1 31x4n 34x5n 36x4 36x5 36x6 36x7 32x4½1	38x7n 30x3½p 34x4½ 34x5n 36x7 36x5d 40x6d 40x7d 132x4½n	Graham Brs. CEF Gramm-Pion 10 Gramm-Pion 55 Gramm-Pion 20 Gramm-Pion 30 Gramm-Pion 40 Gramm-Pion 50 Gray WOA	11/2 11/2 11/2 2 3 4 5-6	1325 1245 1750 2250 2475 3300 3850 4450 575	Do. Ly. Co-N Co-J4 Co-K4 Hi-500 Hi-200 Co-B2 Own	374x4½ 334x5 334x5 334x5 4½x5 4½x5¼	Dod. B&B. Ful. Ful. Own. Own. Own. Own.	Dod . B-L Ful Own .	Own. Sa-1483 . Cl-1D. Ea-603. Sh-103. Sh-21. Sh-31 Sh-51 Ti.	SB SB WO WO WO WO SB	33x4341 33x5n 36x3141 36x3141 36x3141 36x5k 36x5k 36x5k 36x6k 30x3141 34x46	33x5u 36x5ki 36x5ki 36x8k 36x10 36x10 40x6k
Commerce 99 Commerce 14 Commerce 25 Corbitt S Corbitt D Corbitt D Corbitt B Corbitt B Corbitt A Corbitt A	21/2 11/2 2 21/2 3 31/4-4		Co-J4 Co-K4	334x5 418x514 312x5 334x5 334x5	B-L. B-L. B-L. B-L. B-L. B-L. B-L.	B-L. B-L. B-L. B-L. B-L. B-L. B-L. B-L.	Ti	WO. WO. WO. WO. WO. WO. WO. WO.	36x3\2\136x4k 34x4\2\134x3\2\134x3\2\136x3\2\136x4k 36x4k 36x4 36x4 36x5	36x5k 36x7k 34x4½n 34x4k 34x4k	Harvey. WFB Harvey. WHB †Harvey. WFT †Harvey. WHT Hendrickson. O Hendrickson. N Hendrickson. K Indians	2!4 3!2 6 10 1!4 3 4 6	2950 3950 3050 4050 2525 3200 3725 4725	Bu-ETU Bu-YTU Bu-ETU Bu-YTU Bu-ETU Bu-EBU Wa-EU	4½x5½ 4½x6 4½x6½ 4½x6 3¾x5½ 4½x5 4½x5½ 5x6	Ful. Ful. Ful. Ful. Ful. Ful. Ful.	B-L. B-L. B-L. Ful. Ful. Ful. Ful.	Sh-21 Sh-32 Sh-21 Sh-32 Ti-6460. Ti-6560. Ti-6760. Ti-5511.	WO. WO. WO. WO. WO. WO. SB.	36x4 36x6 36x5 36x0 36x4 36x4 36x5 36x6	36x8 36x12 36x10 36x12 36x5 36x7d 36x10 40x12
Day-ElderAN Day-ElderBN Day-ElderDN Day-ElderCN Day-ElderCN Day-ElderFN Day-ElderFN Day-ElderFN Day-ElderFN Day-ElderAR DearbornF Dearborn48 Denby33	21/2 3 4 5-6 1 11/2	1600 1980	Bu-WTU Co-J4 Co-K4 Bu-HTU Co-L4 Bu-YTU Bu-Mu Bu-WU Bu-WU Co-N Co-J4	14/4x5/2 4/2x5/2 4/2x6 35/8x5/8 33/4x5/8 33/4x5/8	B-L B-L B-L B-L	B-I B-L Ful Ful	Ti-6460 Ti-6560 Ti-6560 Ti-6666 Vi Wi Wi Cl-B300*	WO. WO. WO. WO. WO. WO. SB.	34x3½ 34x3½ 36x4 36x5 36x5 35x5n 34x4 34x4½ 34x5n 35x5n	34x4 34x5 36x7 36x8 36x5d 40x6d 35x5n 34x5 34x7 34x5n 38x7n	Indiana 12 Indiana 20 Indiana 25 Indiana 35 Indiana 35 Indiana 51 International 21 International 3 International 41 International 41 International 101	2 2½-3 3½-4 5-7 1 1 1½ 2	1650 2100 2400 3600	Wa-BUX Own Own Own Wa-EU4 Ly Own Own Own Own	334x514 418x512 418x512 438x512 5x614 312x5 312x514 312x514 312x514 414x5	B&B. B&B. B&B. B&B. Mun. Own. Own. Own.	B-L. B-L. B-L. B-L. Mun. Own. Own. Own.	Sh-1501 Sh-103 Sh-21 Sh-32 Sh-51 Own Own Own Own Own	WO WO WO IG IG IG		36x31 36x5k
Denby. 35 Denby. 27 Denby. 270 Denby. 210 Denby. 210 Denby. 214 Dependable. CD Dependable. EG Diamond T. T Diamond T. T Diamond T. U2 Diamond T. K D	4 5 7 11/2-2 21/2-3 1-11/4 11/2 31/2 5 5 1 121/2	2975 3695 4295 4945 2350 2950	Co-L4 Co-B5 Co-B5 Bu-CT U Bu-ETU Hi-700 Hi-1400 Hi-1500 Co-B5 Own Own	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Ful Ful Ful Ful Cov Cov Cov Cov Own.	Ful Ful Ful Ful Ful Cov Cov Cov Cov Vov War	Cl-3D. Cl-5D. Ru. Wi-800J Wi-900C. Own. Ti-6460. Ti-6560. Ti-6666. Ti-6760.	WO WO WO WO SB IG WO	36x4 36x5 36x6 36x6 36x5 36x3 36x3 36x3 36x3	36x8 36x5d 40x6d 40x14 34x8 36x10 36x4 36x5 36x8k 36x5d 40x6d 40x6d 40x6d 32x4n 33x5n 36x7 36x10	Kalamazoo T Kalamazoo. LG Kalamazoo. NH Kalamazoo. NH Kalamazoo. OK Kalamazoo. OK Kelly-S. K38 Kelly-S. K38 Kelly-S. K41 Kelly-S. K61 Kissel. Kissel.	11/2 3 3 4 5 11/2 21/2 31/2-5	3500 4000	He-O Co-N He-O Wi-TAU Wi-UAU Wi-VAU Own	41/4x6 41/4x6	Ful Ful Ful Ful	Com. Ful Ful Ful Ful B-L B-L B-L War. War. War.	Sh-1501.	WO WO WO	34x5n 34x4 36x4 36x5 36x5 36x5 36x6 36x4 36x4 36x4 36x4 36x4 36x5 36x6 34x5n 36x4 36x5	34x5n 34x5 36x7 36x10 36x10 36x12 40x14 36x6 36x4d 36x4d 36x10 36x7d 34x5n 36x6 36x8 36x8
*—Make Opti †—Short whe \$-6 cylinder: -All 4 cyl. otherwise spe ††—Truck Tra *—Front whe h—price included dual k—pneumatic at extra cost h—pneumatic	elbase engine ecified ctor el driv les bo	ve dy or optio	cab	ENGI Bu—I Co—C Do—I He—I Hi—F HS—I Ly—I Wi—M Wa— Wa—	Buda ontine Dodge Iercul Iinkle Jersch Voom	es y nell-Sp ing	olliman	1	B&B B-L- Bak Cam Cot- Cov- Del- Det-	- Borg - Brown Baker - Campl - Cotta - Covert - Detlaff	bell	1	Mec-Mun-F. DWar-REAH	Mechani -Muncie -Twin I -Warner t AXL: American ark blumbla	es Disc		S S S S S S S S S S S S S S S S S S S	tu—Rus n—Salia h—Shel i—Tim o—Torl Vn—Wa Vi—Wis h—Chai h—Chai h—Chai P—Spir P—Stra VO—We	sel bury don cen bensen liker consisin ble E consisin liker	n Reductio	n

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Current Motor Truck Specifications—Continued (This list comprises trucks distributed on a national basis)

			ENG	INE			REAR	XLE	TI	RES				ENG	INE			REAR .	AXLE	TI	RES
MAKE AND MODEL	Tons Capacity	Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	MAKE AND MODEL	Tons Capacity	Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear
arrabeeJ4	1-11/4			3 ³ / ₈ x4 ¹ / ₂ 3 ³ / ₄ x5	B-L	B-L B-L	Sa-1480 . Sh-1501 .	SB WO	34x5n 34x3 ¹ / ₄ k	34x5n 34x5k	Schwartz65 Schwartz90	2½-3 3½-4	\$3480 4160	Bu-ETU Bu-YTU		B-L B-L	B-L. B-L.	Ti-6560. Ti-6666.		34x5 36x6	34x5 36x6
rrabeeK5 rrabeeL4	21/231/2		Co-L4	41/2x51/2 41/2x51/2	B-L	B-L B-L.	Sh-22 Sh-31	WO	36x4 36x5	36x8 36x10	Schwartz120 Selden30C	5-7 11/2	4890 2375	Bu-BTU	5 x6½ 3¾x5	B-L B-L	B-L	Ti-6760.		36x6 34x31/2k	36x7 34x5
accarL2 accarHA	11/2		Co-K4	41/6x51/	B-L	B-L B-L	Ti-6460 Ti-6560	WO	36x4 36x4	36x6 36x4d	Selden50B Selden53B	216	3250 3550	Co-K4	41/8x51/4 41/2x51/2	B-L B-L.	B-L.	Ti	WO	36x4k 36x4k	36x7
accarH2	4		Co-L4	41/8x51/4 41/2x51/2 41/2x51/2	B-L	B-L B-L	Ti-6560 Ti-6666	WO	36x4 36x5	36x5d 36x6d	Selden70B Selden73	31/2	4175 4475	Co-L4 Co-B5	11/2x51/2 18/4x6	B-L B-L	B-L. B-L.	Ti	WO	36x5k 36x5k	36x1
accarG acDonaldO acDonaldA	5-6 3-5		Co-B2	43/4×6	B-L	B-L B-L	Ti-6760	WO	36x6 36x6	40x6d 36x10	Selden90A Service12	5	4950	Co-B5 Mi-410	43/4×6 33/8×41/2	Del Hoo	B-L Det	Ti-5311.	WO	36x6k 32x41/2n	40x1
ackABI	11/2	3000	Bu-WTU Bu-YTU Own	4x5	Own.	B-L Own.	Own	Ch	40x7 36x4	40x14 36x31/2d	Service25 Service33	11/2		Bu-WTU Bu-GBU	334x51/8 4 x51/4	B-L B&B.	B-L. B-L.	Ti-6352	SB WO	34x5n 34x3½	34x5 34x6
ckAB	2	3450 3300	Own	4x5 414x5	Own.	Own.	Own	DR	36x4 36x4	36x31/2d 36x4d	Service61	3		Bu-EBU Bu-EBU	11/4x51/2	B&B.	B-L.	Ti-6460. Ti-6560.	WO	36x4 36x4	36x7
ckAB	21/2	3750 3400	Own	41/4x5 41/4x5	Own.	Own.		Ch	36x4 36x4	36x4d 36x4d	Service81 Service103	6	†	Bu-EBU Bu-YBU	41/4x51/2 41/2x6	B&B.	B-L. B-L.	Ti-6760	WO	36x5 36x6	36x1 40x1
ckAB	31/2	3850 4950		5x6	Own.	Own.	Own	DR	36x4 36x5	36x4d 40x5d	Signal NF Signal H	$\frac{13}{4}$ $\frac{21}{2}$		Co-J4 Co-K4	334x5 41/8x51/4	B-L B-L	B-L.	Ti-6352 Ti-6460	WO	34x5n 34x4	36x6
ckAC	61/2	5500 5750	Own	5x6 5x6	Own.	Own.	Own	Ch	36x6 36x6	40x6d 40x12	SignalJ SignalM			Co-K4	11/8x51/4 41/2x51/2	B-L B-L	B-L.	Ti-6560 Ti-6660	WO	34x4 36x5	36x8 40x1
MackAC	5	6000 3400	Own	5x6 41/4x5	Own.	Own.	Own	Ch	36x7 36x4	36x4d	Standard75	71/2	1330	Co-B5 Co-N	43/4×6 33/4×5	B-L B-L	B-L. B-L.	Ti-6760 Ti-6250	WO	36x6 33x5n	40x1
MackAC MackAC	7	4950 5500	Own	5x6	Own.	Own.	Own	Ch	36x5 36x6	40x5d 40x6d	Standard1½K Standard2½K Standard3½K	21/6	1695 2795	Co-K4	33/4x5 41/8x51/4	B-L	B-L.	Ti-6352 Ti-6560	WO.	34x3½ 36x4	34x5 36x8
MackAC MackAC	15	5750 6000 1200	Own Own He	5x6 5x6 4x5	Own. Own Hoo	Own. Own. War.	Own Fl	Ch SB	36x6 36x7 34x5n	40x12 40x7d	Standard5K	5	3645 4495	Co-L4 Co-B5	4½x5½ 4¾x6 3½x4¼	B-L	B-L.	Ti-6666 Ti-6760	WO WO SB	36x5 36x6 30x31/20	36x1 40x1 30x3
aster11 aster21			Bu-WTU Bu-OU		Ful	Ful	Ti-5511 TI-6460	SB WO	33x5n 34x4	34x5n 33x5n 34x6	Star	11/2	3240†	Wa-FU	1x53/4 1x53/4	Own. B-L	War. B-L.		WO	36x3½k 36x4k	36x8
aster 41 aster 51	21/2		Bu-ETU	41/4x51/2 11/2x6	Ful B-L		TI-6560.	WO	34x4	36x8	Sterling	21/2	3440†	Wa-FU Wa-CU	43/8x53/4	B-L	B-L.	Ti-6560	WO.	36x4k	36x6
ster61	5		Bu-YTU	11/2×6	B-L	B-L	TI-6666. TI-6760.	WO	36x5	40x10 40x12	Sterling	31/2	4750† 5400†	Wa-DU. Wa-EU.	5x614	H-S	Own.	Ti-6760.	WO.	36x5 36x6	40x
xwell	11/2	1095 1650	Bu-ATU Own Wi-SU	35/8x41/2 4x5	B-L Own. B&B.	B-L Own. Det	Ti-6760.	WO	36x6 35x5n 35x5n	40x14 35x5n	Sterling	71/2	6500†	Wa-EU	5x61/4	H-S	Own.	Own	Ch	36x6	40x
enomineeB enomineeHT enomineeH	134	2000 2475	Wi-FAU. Wi-EAU	33/4×5 4×5	Ful	Del Del	Co-5200. Wi-800G Wi-800H	WO	34x31/2k 36x31/2k	35x5n 36x5k 36x5k	Sterling. Sterling. Sterling. Stewart. 16 Stewart. 15-X Stewart. 9 Stewart 7K Stewart 10X Stewart AS	11-11	990 1495 1870	Bu-MU.	3 ³ / ₈ x5 3 ⁵ / ₈ x5 ¹ / ₈ 3 ³ / ₄ x5		Ful.	Cl-AW.	IG	34x4½n 35x5n 34x314k	35x
nomineeD	2-21/2	2875 4850	Wi-TAU Wi-RAU	4x6	Ful B&B.	Del	Wi-800J. Ti-6760	WO	36x4 36x6	36x8 40x12	Stewart7K	21/2-3	2590 3440	Co-N Bu-HTU Bu-YTU	41/4x51/2 41/2x6		Ful.	Cl-2D	IG	34x31/2k 34x4k 36x5	34x 36x
sh2018	11/2	1695 1595	Own	3½x5 3¾x5¼	B&B.	Own.	To-A Cl-1D	IG	34x5n 34x4	36x6n 34x5	StoughtonAS	34-114	1185 2100	Mi-410 Wa-BUX	33/8x41/2	Del B-L	Cam B-L.	Co-52000 Co-52000	BB	34x41/20 34x5n	
sh4017F sh3018	2-2/2	2750	Bu-HU Own	41/4x51/2 33/4x51/4	B&B.	Own.	Own Cl-2D	IG	36x6 34x4	36x6 34x7	StoughtonB StoughtonB StoughtonD	11/2	2150 2490†	Wa-BUX He-CU3	33/4x51/4 4x51/8		B-L. B-L.		WO	36x3½ 36x4	36x
sh5018 bleA-75		2250 1395	Own	33/4x51/4 33/4x51/8	B&B.	Det Ful	Cl-2D Cl-300	IG. SB	34x4 34x4 ¹ / ₂	34x7 34x41/2	StoughtonF	3	3150	Mi-402	41/8x51/4	B-L.	B-L.	Sh-21	WO	36x5	36x
ble A-21 ble B-31	11/4	1890 3795	Bu-WTU Bu-CTU	334x518	Ful.	Ful		WO.	34x5	34x5	Thomart20 TiffinGW	11/2-2	2100	Hi-400	4x51/4 41/8x51/4	Ful	War.	Ea-1000.	SB	34x5n 36x3½	34x
obleE-71	21/2	3150 3850	Bu-ETU Bu-YTU	41/4x51/2 41/2x6	Ful	Ful War.	Sh-21 Sh-30	WO	36x4 36x4 36x5	36x7 36x8 36x10	TiffinMW TiffinF35 TiffinTW	21/2-3 31/2-4	2700† 3600† 4300†	Co-C4 Co-L4 Co-B2	41/8x51/4 41/2x51/2 43/4x6	Ful Del B&B.	Ful. Cot. Cot.	Sh-21 Sh-31 Sh-51	WO WO	36x4 36x5 36x6	36x 40x 40x
d ReliableB d ReliableC	21/2	3500 4250	Wi-UAU Wi-VAU	414x6	Ful	Ful	Sh-21 Sh-31	WO	34x4 36x5	36x8 36x12	TiffinUW	6-7 214	4500† 2700	Co-B2 Bu-HTU	43/4×6 41/4×51/2	B&B. B&B.	Cot.	Sh-51 Own	WO.	36x6 36x4	40x
d ReliableD d ReliableK	716	5000 6000	Wi-RAU	13/4×6	Own Own.	B-L Own.	Sh-51 Own	WO	36x6 36x6	40x12 40x14	TitanTitan	312	3600 4100	Bu-YTU Bu-YTU	41/4x51/2 41/2x6	B&B. B&B.	Cot.	. Own	DR.	36x5 36x5	40x
dsmobileT neidaB	11/2-2	1095 2825†	Own Hi-400	311x514 4x514	Ful	War. Ful	To-OX2L Wi-800J.	IG WO	35x5n 36x31/2	35x5n 36x7	Traffic	11/2	1595 1695	Co-N	33/4x5 33/4x5	Cov	Cov.	Ru Ru-3000	IG	35x5n 34x3½	35x
eida	316	3200 4050	Hi-400 Hi-200	4x51/4 41/2x51/2	Ful.	Ful	Wi-900C	WO	36x4 36x5	36x7 36x10	Traffic	3	1895	Co-N	33/4 x5 33/4 x5	Cov	Cov. Ful.	. Ru-6000 . Co-5102	. IG	36x4 32x41/21	36x
erland91ce triot, Revere	1/2	425 1295	Own Co-N	33/8x4 33/4x5	B&B. B&B.	Own.	Own	SB WO	30x3½n 35x5n	30x3½n 35x5n		11/2		Bu-WTU Bu-GTU	33/4x51/8	Ful.	Ful.	. Cl-1D	. IG	34x3½ 36x3½	34x
triot, Lincoln	2 3	2400 3000	Hi-400 Hi-200	1x51/4 41/2x51/2	Cov	Ful Cov	Ti-6560 Wi-900	WO	34x4n 36x5n	34x4n 36x8n	Transport55			Co-C2 Bu-ETU	41/8x51/4	Ful.	Ful.	Cl-2D	. IG	36x4 36x4	36x
erce Arrow.XA	2	3300 3500	Own	4x51/2	Own.	Own.	Own	WO	36x4	36x4d 36x5d	Transport75			Bu-YTU Bu-WU.	41/2×6	B&B	Cot.	. Cl-3D	. IG	36x5 34x3½	36x 34x
erce Arrow . WC erce Arrow. WD	5	4700	Own	11/2x634	Own.	Own.	Own	WO	36x6 36x6	36x6d 40x7d	TraylorD	2-21/2 3-31/2	2850 3300	Bu-ITU. Bu-HTU	4x51/2	Cov.	Cov.	Sh-103.	. WO.	36x4	36x
erce-Arrew.RE	7	5100 5200	Own	11/2×3%4 11/2×6%	Own.	Own.	Own	WO	136x6	40x7d 40x8d	TraylorF	1	1285	Bu-YTU HS-7000	4½x6 3½x5	B-L.	B-L. Ful.	Sh-32 Cl-E360	SB	34x41/21	
inierR31 inierR29 inierR36	1		Co-N	3 ³ / ₄ x5 3 ³ / ₄ x5 3 ³ / ₄ x5	B-L B-L	B-L B-L	Ti-6250	WO	35x5n 34x31/2	35x5n 34x4	TriangleC	$\frac{1\frac{1}{2}-2}{2-2\frac{1}{2}}$	1985 2285	Wa-BUX Wa-BUX	33/4x51/4	Ful.	Ful.	. Cl-1D	. IG	34x4k 36x4k	34x 36x
iniar R28	2-216		Co-K4	41/8x51/4	B-L	B-L	Ti-6460 Sh-103	WO	34x3\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	34x5 34x7	Ultimate AJL	2½-3 2			41/4x51/2	Ful B-L.	B-L.	. Cl-2D Sh-103.	. WO.		
inierR29 inierR25 inierR27	312-5		Co-L4	41/8x51/4 41/2x51/2	B-L	B-L	Ti-6666	WO	36x5	36x8 36x5d	UltimateB UltimateD	5		Bu-ETU Bu-BTU	5x61/2	B-L.	B-L.	. Sh-51	WO.	. 36x7	36x 40x
oF	11/4	1185 1485b	Own	13/4×6 11/8×41/2 11/8×41/2	Own	Own.	Ti-6760 Own	SB	34x41/21	40x6d 34x4½n	United H'way 15 United 30	11/2		HS-7000 He-O	4x5	Ful. B-L.	B-L.	. Co-3100 . Co-5200	0 SB	. 34x5n	34x
public75 public11 X	11/4	14000	Ly-KB	334x5 334x5	Ful.	Ful	Own To-750	IG	33x5n	33x4½n 33x5n		21/2		He-O	4x5	B-L.	B-L.	. Wi-60	. DR.	. 34x4	34x
public19 W	3		Wa-FU.	4x53/	Ful	Ful Ful	To-CT2. To-CT2. To-CT2.	IG IG	34x4 36x4 36x4	34x6 36x7	United C United States U United States N			Bu-WTI	13%x51/4	Ful.	Ful.	. Sh	WO. SB	. 34x5n	36x 34x 36x
public20 weCW	416	3000	Co-K4 Co-L4 Wi-CAU	41/2x51/2	Ful B-L.	Ful B-L	To-E	IG WO.	36x5 36x6n	36x7 36x10 36x6n	United States NW United States NW	12		Co-N Bu-WTU Hi-400.		Ful.	Ful. Ful. B-L.	Cl Sh-103. Sh-21.	. WO.	. 36x3½ . 36x4 . 36x4	36x 36x
weCDW	2				B-L.	B-L	Sh-103 Sh-21	WO.	34x5 34x5	36x31/2d 36x4d	United States S United States S	4		Hi-200.	41/6x51/	B-L	B-L	. Sh-31	. WO.	. 36x5 . 36x6	36x 40x
weGSW	3	4150 4500	Wi-TAU Wi-UAU	4x6 41/4x6	B-L.	B-L B-L	Sh-21 Sh-31	WO.	34x6 36x7	36x5d 36x6d	United States T Velie 46	6	1585	Hi-200. Bu-ATU Co-N	1 43/4 x 61/2 33/4 x 5	B-L.	B-L. Dur.	Sh-51 To-C2	. WO.	36x6 36x31/2	40x 36x
weFW iggles15	5	4850 895	Wi-BAU Wi-NU Wi-TAU Wi-UAU Wi-VAU HS	4½x6 3½x5	B-L. M&E	B-L	Sh-51 Co	WO. SB	. 36x7	40x6d 32x4½n	Vim50 Walter	1/2-3/4	995	Own	. 4x5	Own	Own B-L	. Own	. SB	. 32x4n . 36x4	32x 36x
aggles40	11/4	2095	Own	4x5	B-L.	B-L.	Co-52000 Wi-65		. 34x5n	34x5n 34x7	Walter1	5 5		Own	41/6x61/	B-L.	. War	Own	. DR.	. 36x6	40x 34x
uggles 40H indow CG&G	21/2	2295	Own	4x5	B-L.	B-L.	Wi-88E.	DR. WO.		36x8 34x5	White		3250 4200	Own	33/4x51/3	Own	. Own	Own	. DR.	. 36x4	36x 40x
ndow J	2½ 5	2750‡ 4325	Co-C4 Co-B5 Co-8R‡. Co-N Co-C4 Co-E4	41/8x51/4 43/4x6	B-L.	B-L	Ti-6560. Ti-6760.	WO.	. 36x4 . 36x6	36x7 40x12	White45	5	4500 1900	Own Bu-CTI Own	41/4×53/ 133/×51/	Own B-L.	. Own	Own	IDR	. 36x6	40x 35x
anford10	34-114 116-2		Co-8R‡.	33/8×41/ 33/4×5	B&B B-L.	B-L. B-L.	Sa-D Sh-1501	SB. WO.	. 33x5n . 36x31/2	33x5n 36x5k	Wilcox RI	1 11/2 21/2	2550 3000	Own	414x5 414x5	B&B	. Own	. Wa-2A. Wa-25A	SP DR. DR.	. 36x6k	38x 40x
nford25 inford35	31/2-5		Co-C4	41/8x51/4 41/2x51/	B&B B&B	B-L.	Sh-21 Sh-31	WO.	. 36x4k . 36x5	36x4d 36x5d	Wilcox	31/2	3950 4350	Bu-YTI Bu-ATI	41/2x6 143/4x61	M&I M&I	Own Own	. [Wa-oA.	. DR.	. 36x5 . 36x5	36x 40x
nford50	5-7 1½	2500	Wi	4½x5½	Ful.	Ful.	Sh-51 Wi	DR.	. 36x31/2	40x6d 36x7k	Wilson	111/6	1350 2270	He-O	. 4 x5	B&B B&B	Det.	Ti-6532	. WO.	. 36x31/2	34x 36x
chacht	3	3200 3800	Co-E4 Wi. Wi-UAU Wi-UAU	4 4 x 6 4 4 x 6	B&B B&B	Own.	Own	. WO.		36x7 36x5d	Wilson	21/2 31/2	2825	Co-K4.	41/ex51/	(B&B	. Cot.	Ti-6560	WO.		36:
hacht hacht	5	4400	Wi-VAU Wi-VAU Bu-WTU	141/286	B&B	. Own	. Own	WO.	. 36x5	40x5d 40x6d	Wilson	15	4520	Co-B2	. 434x6	B&F	Cot.	Ti-6660 Ti-6752 Ti-5762	WO.		40
hwartz20	14 11/	1980	D. WTI	T 237-51	ART.	D T	Ti-6250	WO	24-8-	34x5n	Yellow Cab M4	1.74	1640	O. 14.	. 334x5	D.T.	" D.T	Ti-6352	TITO	35x5n	35

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

C		3.7		T	T	24
	a.	PAL	4			- PN

			ENG	INE			REAR A	XLE	TI	RES				ENG	INE			REAR	AXLE	TI	RES
MAKE AND MODEL	Tons Capacity	Price	Make & Model	Bore & Strokes	Clutch Make	Gearset Make	Make & Model	Final Drive	Front	Rear	MAKE AND MODEL	Tons Capacity	Price	Make & Medel	Bore & Strokes	Clutch Make	Gearset Make	Make &	Final Drive	Front	Rear
Getfredson	114-2 214 4 5 114 2 3	2300 3000 3975 4800 3000 3600 4050 4800	Hi-500 Hi-200	4x51/4 41/4x51/2 41/2x6 5x61/2 33/4x51/4 4x51/4 41/4x51/2	B-L B-L B-L Ful Ful Ful Ful	B-L B-L B-L Ful Ful Ful	Ti-6460 Ti-6560 Ti-6666 Ti-6760 Sh-1501 Sh-103 Sh-21	WO WO WO WO WO WO	34x5 36x6 34x5n 36x4 36x4 36x5	34x5n 38x7n 36x8 36x12 40x14 36x6n 36x7 36x4d 36x5d 36x6d	National FA National GA National HD National NB National OA Veteran M Veteran P Veteran R Veteran S	114 214 314	\$2699 3699 4200	Wa-BUX Wa-CU Wa-DU. Wa-EU	3¾x5¼ 4¾x5¾ 4½x6¼ 5x6¼ 3¾x5¼ 4¼x5¼	B-L H-S H-S B&B. B&B. B&B.	B-L. B-L. Cot. Cot. Cot.	Sh-21	WO WO WO	34x4k 36x5 36x6 36x7 34x5n 36x4 36x4	35x5n 34x6k 36x10 40x12 40x14 34x5n 36x7 36x7 36x10

Current Tractor Specifications

	ey	d No.		EN	GINE		mbers.			No.		EN	GINE		mbers.		6	N S S		EN	GINE		mbers.
MAKE & MODEL	Drawbar-Pull Rating	Recommende of 14 Ins. Plo	Price	Make _	No. of Cyls Bore & Strake	Weight (Lbs.)	†Traction Me Dimensions,Di & Face (Ins.	MAKE & MODEL	Drawbar-Pull Rating	Recommende of 14 Ins. Plo	Price	Make	Ne of Cyls. Bore & Stroke	Weight (Lbs.)	†Traction Me Dimension,Dj & Face (Ins.)	MAKE & MODEL	Drawbar-Pull Rating	Recommende of 14 Ins. Plo	Price	Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	†Traction Me Dimensions,Di
AllworkG	6-12 15-25 20-35 14-28 14-28 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 15-30 16-30 16-30 16-30 12-20 16-30 16-32 16-	1 3 4 4-5 3 3 3-4 4-5 5-6 8-10 3 3 4 4-5 8-10 3 4 5 8-10 3 4 4 5 8-10 3 4 5 8-10 3 4 5 8-10 3 4 5 8-10 3	\$295 1185 1885 1495 1295 1190 3100 4400 4250 2500 1095 1350 2650 4900 4200 4200 4200 4200 4200 4200 420	LeR Mid Mid Own Uwn Own Own Own Uwn Own Ow	4-3 x 4 3 4 4 4 5 x 6 4 4 5 x 6 4 4 5 x 6 4 6 x 7 4 7 x 8 6 4 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 4 7 x 8 6 7	2500 4700 6150 6500 5200 7800 12500 12500 12500 22200 3600 4850 8500 8100 8100 8100 8100 9400 9400 9400 9400 9400 9400 9400	48x 6 46x12 50x12 48x12 48x12 48x12 70x20 90x24 50x12 60x16 69x20 87½x26 48x10 *64x12 *64x12 *68x11½ *89x20 52x12 52x12 52x12 52x12 52x12 52x12 54x12 48x12 48x12 48x12 48x12 64x12 64x12 64x12 64x12 65x16 72x20 *8x10 *8x	Little Giant	R-36 22-40 -20 -30 9-16 12-25 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-18 15-30 12-25 10-20 12-25 10	4 4 2 3 3 3 2 3 3 4 2 2 3 3 4 4 5 6 12 -16 3 2 -3 2 -3 4 4 10 3 4 4 6 10 3 4 4	2150 2385 	Wau. Wau. Own. Own. Own. Wau. LeR. Wau. Mid. Mid. Mid. Sea. Own. Own. Own. Own. Own. Own. Own. Own	4-42x62 4-5x64 4-5x64 4-45x62 4-45x52 4-45x52 4-45x54 4-45x54 4-45x54 4-45x54 4-45x54 4-45x54 4-45x54 4-45x54 4-45x6 4-5x6 4-5x6 4-5x6 4-5x6 4-5x6 4-45x54 4-45x54 4-45x6 4-45x	6200 \$\frac{1}{6900}\$ \$\frac{4438}{4438}\$ \$\frac{4438}{6900}\$ \$\frac{1}{8}\$ \$\frac{1}{	46x10 52x10 52x10 52x10 52x18 54x 8 54x 8 60x10 60x10 60x10 60x10 60x10 60x20	Shaw-Enechs (Gr.) Topp-Stewart. B Topp-Stewart. B Tore. Townsend Townsend Townsend Townsend Traylor. Twin City. Twin City. Uncle Sam. C-20 Uncle Sam. B-19 Uncle Sam. D-21 Wallis. Okwaterloo Boy. N Wetmore. Wisconsin. Wisconsin. Wisconsin. Wisconsin. Wisconsin. Wisconsin. Wisconsin. F Beeman. Jr. Beeman. J	30-60 15-30 30-45 6-10 10-20 10-20 10-20 12-20 12-20 12-20 30-45 6-12 12-20 12-2	8-10 3-4 4-5 8-10 4 2-3 3-4 4-8 1 3-5 8 2-3-4 3-4 3-4 4-5 8 N	\$675 8000 12000 12000 12000 12000 12000 1535 1485 1185 1185 12750 4500 1 R \$385 195 265 180 345 495 495 495 495 495 495 495 495 495 4	Own. Cli LeR. Wau LeR. Own. Own. Own. Bea. Bea. Own. Own. Own. Own. Own. Own. Own. Own	2-10x12 4-5 x6\\\\ 4-5 x7\\\ 4-8 x10\\\ 4-8 x10\\\ 4-8 x40\\\\ 4-8 x40\\\\ 4-8 x40\\\\\ 4-8 x20\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	26700 6000 7900 22550 4400 7800 6500 1500 1750 8100 23700 3000 4650 4650 4660 5660 5660 7550 10130	80x30 80x30 60x16 84x28 84x212 948x12 96x24 33x10 50x12 60x20 84x24 46x12 50x12 50x12 50x12 60x20 33x10 30x 4 30x 3 20x 24 30x 3 10x 3 22x 51 22x 32x 4 22x 51
R&C Dalama			-	-					-						-							-	

B&S—Briggs & Stratton Cli—Climax Ben—Beaver Bud—Buda Her—Hercules LeR—LeRoi

Wis-Wisconsin †-Unless otherwise specified all trac-tion members are of the wheel type.

*—Track Type, length of ground contact surface ‡—Drum Type

Current Taxical Specifications

						ENGINE				RICAL TEM				REAR AX	LE
NAME AND MODEL	Price	Wheel Base (Ins.)	Tire Size (Ins.)	Weight (Lbs.)	Make and Model	No. of Cyls., Bore and Stroke		Carbu- reter Make	Generator and Starter Make	Ignition Make	Clutch: Type and Make	Gearset Make	Univer- sal Make	Type and Make	Gear Ratio
Checker. Origgs.	\$2380 1950	117 108½	32x4½ 30x3½	4100 2200	Buda-WTU Own	4-33/4x51/8 4-25/6x41/2				Bosch	m-d Fuller	Fuller		34F-Columbia	4.87
lear 6	2100	118	33x4½ 33x4½	3415 3590	Lycoming—CF Cont—8R	4-35/8x5 6-33/6x41/6	21.03	Carter	Delco		s-p Borg & B s-p Borg & B			%F-Salisbury %F-Salisbury	4.75
nnant	2895*	115	33x41/2			4-334x51/a							Blood	F-Columbia.	4.8
emier.	2400	118	33x41/2	3850	Buda-WTU	4-33/x51/8	22.50	Zenith	Bosch	Bosen	m-d Fuller	Fuller	Blood	3/4F-Columbia	4.70
Rauch & LangT		112	32x4	3200	Buda-WTU	4-334x51/8	22.50							1/2F-Standard	5.1
	2085	102 113	33x4½ 33x4½	4100 3465	Own	Electric 4-41/8x41/2	27.23	None	North E		None m-d Own	None Own	Own	Own	8.6
ellow. Wolls	2340	109	33x41/2	3830	Cont-V4	4-334x5	22.50	Zenith	tNorth.Et.	Bosch	m-d Brown-L.	Brown-L	Spicer	1/2F-Timken	4.9
ellowA2	1995	109	29x41/6	3335	Cont-V7	4-33625	19 92	Zonith	tNorth Et	Rogeh	mad Brown-L	Reown-I.	Spicer	14F-Timken	4.1

ABBREVIATIONS:

---Electrically driven
---Delivered New York

Cont—Continental t—Generator supplied only Strom—Stromberg Westing—Westing—Westinghouse

North. E.—North East S-P—Single Plate M-D—Multiple Disk

The following makes of Taxicabs are also produced: DODGE BROS., WILLYS-KNIGHT. The chassis are identical to those shown in the Passenger Car Specifications.

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

			PRICE	S			(Ins.)	+		1	ENGIN	NE.			TRICAL	1	1		REA	R	8
OPE	N MO	DELS		CLOS	ED M	ODELS	Bare (Ir	(Ins.)†	NAME		*	ower.		SYS	TEM		fake	Type	AXL	E	Service
2-3 Pass.	4-5 Pass.	6-7 Pass.	Spert Medels	2-3 Pass.	4-5 Pass.	6-7 Pass.	Wheel B	Tire Size	MODEL	Make and Model	No. of Cy Bore and Stroke	Rating (N.A.A.C.)	Carburete Make	Generato and Start Make	Ignition Make	Clutch: Type and Make	Gearset Make	Universal; and Make	Type and Make	Gear	BRAKES.
\$1950c	\$1785 1195	\$1850	\$1885c 1395e	\$2250	\$2485 1495	di795p	127 114	33x4½ 32x4	AmericanD-66 Anderson41	H-S 11000 Cont6 Y	6-3½x5 6-3½x4¼	29.40	Strom	G-D	A-K	e-p B&B s-p B&B	B & B	m Hart .	F Salis	4.50	Di De
1495	1495	1595	{1785b 1915e		11695 1995d		122	32x4	AndersonSeries 50	Cont8 R						s-р В&В					
	1535				2200		132 120	33x4 32x4	AndersonSeries 50 Apperson6	Cont8 R Own	6-33/8x41/2 6-31/8x41/4	27.34 23.44	Rayfield.	Remy	Remy	s-p B&B s-p Rock	Durston.	f Univ	3/F Salis	4.62	RLTI
*****	2485 1095 1595	2485	1325d 1850d			\$3385 2345	130 114 124	33x5 31x4 32x4}	Apperson8-23-S Auburn6-43 Auburn6-63	Own	8-31/4x5 6-31/6x41/4 6-31/4x5	23.44	Johnson. Strom	Remy	Remy	m-d Own s-p B&B s-p B&B	Own Warner	m Thie	1/2F Own	4.25	RLR2
			1495		1850 2250g		118	32x4	Barley	Cont6 Y	6-334x434	23.4	Strom	Delco.	Delco.	≠p B&B	Fuller	f M&E.	36F Col.	5.10	RLR
935 1275	965 1295		900g 1135g		1495 1695 2095		109	31x4 32x4	Buick1924 Buick1924	Own	4-33/6x43/4 6-33/6x43/4	18.23 27.34	Marvel.	Delco	Delco.	m-d Own m-d Own	Own	m Own m Own	F Own		
1385g 2985	2985	1565 2985	{1675a 1725d		2235‡	2285	128	33x416	Buick1924	Own	6-33/6x43/4		Marvel		Deleo	m-d Own				4.70	-
1750	1790		2230d	2480c	14150 2575	14600§	122	33x5 32x4½	Cadillac V 63	Cont8 R	8-31/8x51/8 6-33/8x41/2 6-35/8x51/4	1	Own Rayfield:		Delco	m-d Own		m Spicer f Snead.		Opt. 5.09	
1595	1185 {1485 1685	1993 1295 1635	1950e 1335d 1785e		3325 1535 1785 2270	2975 2095 (2385 (2995§	129 117 122 123	33x5 32x4 32x4 32x4	Case. X Case. Y Chalmers. 1923 Chalmers. 1923 Chandler. Six	Cont6 T Own Own Own	6-35/8x514 6-31/4x41/2 6-31/4x41/2 6-31/2x5	25.35 25.35	Strom	A-L	Remy	m-d Own m-d Own m-d Own m-d Own s-p B&B	Own	m Hardy m Hardy	½F Ad	5.13	R1-R2
490	495	395g		640	795	(20008	103	30x316	ChevreletSuperior	Own	4-311x4	21.76	Zenith .)	Remy.)	Remy	o Own	Own	m Own	1/2F Own	3.77	RLRs
1085	1045		(1145d) (1295a)	1345	1365 1545	p1645d	1121/2	31x4	Cleveland42	awO	6-31-14/2	22.50	Holley.	Bosch	Bosch	в-р В&В	Own	m Mech.	1/2F Own	4.90	RLTI
** **	2175	2175		2750c		3075		33x5 34x7	ColeMaster	Nort.M309		1	1	1		m-d Nort.	Nort	m Spicer	F Col.	4.70	Rr-Rs
985c 1395p	985		(1195d 1495d 1595c		1995 {1495 {1650 2195p	p1995d 1895‡		32x4 31x4 32x4	ColumbiaBig Six ColumbiaLight Six Courier	Cont6 Y Falls. 8000	6-31/ax41/4	23.44	Strom Strom	A-L	A-K A-K	8-p B&B 8-p B&B	Durston.	m Spicer m Spicer f Flex	12F Tim	5.10	RLT
	3100	31:0	3500c		4500	4500	138 138	33x41/2 33x5	Crawford23-6-70 Crawf'rd-Dagmar.6-70	Cont6 T Cont6 T	6-356x514 6-356x514	31.54	Zenith Zenith			m-d B-L m-d B-L m-d Own					RLR2
5000	5800 4650	6300 §4700	4650e		7650 6350	6450	142	33x5 33x5	CunninghamV4 Daniels23-38	Own	8-334x5 8-31/2x51/4	45.00	Strom	Deleo		m-d Own m-d Own				4.23	RLR2
1295 1595 850	5000 1295 1595 880	\$150 5150	1495c 1695d 730g	6000c 2095 1035	\$5600 6600 1595 \$1250 1385	6800 1795e	138 115 120 116	33x5 31x4 32x4½ 32x4	Daniels23-38 Davis71 Davis63 Dodge Brothers	Own Cont7 U Cont8 R Own	8-3½x5¼ 6-3½x4¼	39.20 23.44	Zenith Strom.	Delco	Delco	m-d Own 8-p B&B 8-p B&B m-d Own	Own Warner	m Spicer	F Tim	4.23	R-R2 RLR2
870 1010	3950 885 1025 6250 890	3950	4150c 995c 1135c 6500c 1065d	1240 1355	5550 1350 1465 7500 (1365	5800 7800	136 108 115 134 109	33x5 31x4 31x4 33x5 31x4	Dorris	Own LycKB Falls T8000 Own	6-31/ax41/4 8-27/ax5	23.44 26.45	Carter Carter Strom	Bosch Bosch Delco	Bosch Delco	m-d Own m-d Det m-d Det n-p Own	Own Own	m Mech. m Mech. f Cli.	34F Fln. 34F Fln. 14F Own	4.66 4.66 4.45	RLR1 F2DI
1600	1650			2250	1465 2400			32x416	DurantA-22 DurantB-22	ContSpec						s-p Own					
1485	1095 995 1395 1045		1275d 1135d 1595d	1395e ‡1995d 1145		p1565d p2195d		32x4 31x4 32x4 32x4	Earl	OwnK Cont8 R Own	4-3 4x51/4 4-35/8x5	18.91 21.03 27.34	Scoe Strom Strom	A-L Delco Delco	Conn Deleo Delco		Own Warner . Warner	f Own m Peters m Spicer	1/2F Öwn 3/4F Salis 3/4F Salis	4.87 4.50 4.50	R1-T1 R1-R2 R1-R2
1195 265 r	1195 295s	230g	1195	1895e 525	1985 685			32x4½ 30x3½	FlintT			27.34	Strom	DeJon	DeJon	s-p Own	Warner.	m Spicer	1/2F Ad		R1_R1
2975	2975 1950			3975 (2750c	3975	§2950d	132	32x4½ 32x4	Fox Air-Cooled	Own Own	6-3%x5 6-31/4x4	27.34	Holley	West	Scintilla	m-d B-L s-p B&B	B-L	m Own m Spicer	½F Tim	4.90	R1-R2
995 490	995 520		1145c		1445 835			32x4 30x3½	GardnerSeries 5 Gray	LycCE Own	4-311x5 4-35x4	21.76	Zenith	West	West	в-р В&В	Mech	m Peters	34F Fln.	4.80	RLTI
2250	2250 2650			2850‡	2600		120	32x41/2	H.C.S Series 4	Weid					111111111111111111111111111111111111111	s-p Own					
1395 1925e 1995	1395 1345 1775	1345e 1795 (1995 (2250	2150	1950 2175 (26951 (28501	2195 1950 2275	{2795 2995	121 115 121	32x4 32x4 32x4 32x4 33x5	Hanson 66 Hatfield A-42 Hatfield 55	Midw	4-3% x5\/ 6-3\/2x5 6-3\/6x4\/2 4-3\/2x5 6-3\/4x5 6-3\/6x5\/	29.40 27.34 19.60 25.35 31.54	Strom Marvel Zenith Strom Strom	Delco Delco Dyneto Bosch L-N	Deleo Deleo Conn Bosch Kingst.	m-d B-L m-d B-L s-p B&B s-p B&B s-p B&B m-d War	B-L G-L G-L Durston. Own	m Spicer m Univ m Spicer m Spicer m Univ	F Own F Tim MF Col. MF Col. MF Own	4.36 4.66 4.63 4.63 4.60	R1-R2 R1-R2 R1-R2 R1-R2 R1-R2
	1295		1695b 1750d	2195	1895 2495p	2295d		32x4½	Haynes 60	Own	6-3½x5		Rayfield.				Own				
	1295 1175		1225a 1225d	1375d 1445	1895 17 50 1595			34x4½ 32x4	HudsonSuper 6 HupmobileSeries R	Own	6-3½x5 4-3¼x5½	29.40 16.90	Own Strom	Bosch	Bosch	m-d Own m-d Long	Own	m Spicer m Univ	F Own	1.45 R 4.87 F	1-R2 1-R2
1195	1065		1220d		1495 1695p		112	31x4	JewettSix	Own	6-31/4×5	25.36	Strom			m-d Long.					
1750	1675 1995				2285‡ 2485		120 1241/2	32x4 32x41/6	JordanMX JordanH	Own	6-3-x43/4 6-3-4-x43/4	20.34	Ray	Delco	Delco	s-p Detr	Detroit	m Thie	F Tim	4.42	RLR1
1595 1795	1595 1795 1585	1595e 1795e	1995e	2200c 2500 2585‡	1450 1995 2295 2285	2400 2625	112 120 124	32x4 32x41/2 32x41/2 32x4/2	KelseyG KingLL KingL	LycK Own Own	4-35/8x5 8-3 x5 8-3 x5 6-3/4x53/4	20.34 21.03 28.80 28.80 26.34	Strom Zenith Ball&B Ball&B Strom	Bosch West West	Deleo Bosch A-K Remv	s-p Detr s-p B&B s-p Detr s-p Detr m-d B&B	W-M Own Own War	m Spicer f Univ f Univ m Spicer	1/2F Salis F Col. F Col. F Tim	4.70 I 4.88 I 4.66 I 4.40	RLRS RLRS RLRS RLRS
MISC	ELL	ANEO	TIS		- 1	EC NV	GINE			NG. LIC							- 1		loating		_

- n—2 Passenger
 b—3 Passenger
 c—4 Passenger
 g—Chassis Price
 p—Sport Model

- MISCELLANEOUS

 a-2 Passenger d-5 Passenger
 b-3 Passenger e-6 Passenger
 c-4 Passenger f-7 Passenger
 g-Chassis Price p-Sport Model
 †—On Standard Phaeton Models
 †—Brougham &—Limousine
 r-Price without starter and demountable rims. Price, complete, Ford
 \$350; Star \$414.

 Price without starter and demountable rims. Price, complete, Ford
 \$350; Star \$414.

 Continued on page 56

- - (Continued on page 56)

- STARTING, LIGHTING
 AND IGNITION
 A-L—Auto-Lite
 Elsen—Elsemann
 G-D—Gray & Davis
 Kingst-Kingston
 L.—North East
 Split—Splitdorf
 West—Westinghouse
 Wag-R—Wagner or Remy
 \$\frac{1}{2}\$-Starter Auto-Lite

 End

 TRANSMISSION
 Ad—Adams
 Ad—Adams
 Anst—Ansted
 Anst—Mechanics
 North—Northway
 Salis—Salisbury
 Salis—Salisbury
 Thie—Themer
 Thie—Themer
 Thie—Themer
 The—Thermoid
 The—Thermoid
 Tim—Timken
 Univ—Universal
 T—Transmission
 T—Transmission

RLTI

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RLRI

F1_R1

RLR:

RLR:

Ri-Ri Ri-Ri Ri-Ri Fi-Di Ri-Ri

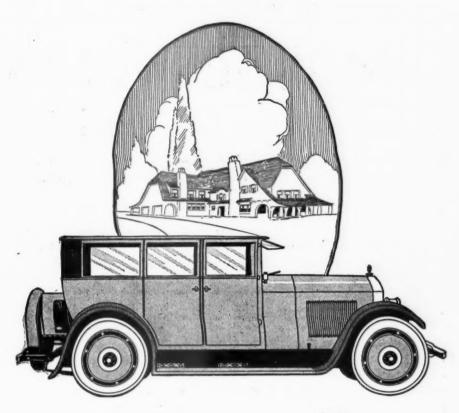
R1-R2

RI-TI RI-RI RI-RI RI-RI

LT1

1-R2

L.Ţ1



Specifications of Sport Sedan Model

Coachbilt Anderson Aluminum Body, 6-cylinder Red Seal Continental Motor, Westinghouse Starting, Lighting and Ignition; Borg & Beck Clutch; Steel Disc Wheels with 5 Cord Tires and Tire Cover; Luggage Trunk on rear fitted with 2 Suit Cases; Bumpers and Snubbers, front and rear; German Silver Radiator Shell; Dome and Reading Lights; Vanity Case and Smoking Set; Heater; Sun Shade; Foot Dimmer for Headlights. Color—Gray, with black fenders and black upper body; Wheelbase 115 inches. Averages 19 miles per gallon of gasoline.

ANDERSON MOTOR COMPANY Rock Hill S. C.

The Coachbilt

ANDERSON

ALUMINUM SIX

The

Sport Sedan

only

\$1895

Touring Car \$1195; Coach \$1495; Coupe \$1425; Sport Touring \$1445; Sedan \$1695.

f. o. b. factory

Current Passenger Car Specifications (This list comprises cars distributed on a national basis)

			PRICES	3			(Ins.)	1	ist comprises ca	1	ENGIN			ELECT	RICAL				REAL	R	e si
OPE	N MOI	DELS		CLOS	ED M	DDELS	Base (In	e (Ins.)†	NAME		-de-	Power C.)	- 10	515	rem	ype	Make	: Type	AXL	E	ES. Service
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.	Wheel B	Tire Size	MODEL	Make and Model	No. of C. Bore and Stroke	Rating (N.A.A.C	Carburet Make	Generate and Star	Ignition	Clutch: Tyl	Gearset	Universal and Mak	Type and Make	Gear	345 (1)
\$2385 5000 1795	\$1885 5000	\$2385 5000 (1795	\$2385e		3375 2975 6300 (2345	3075 3375 6500	124 132 123	32x416 33x5 32x416	Kissel45 LaFayette Lexington23	Own	6-3 Ax51/2 8-31/4x51/4 6-31/4x41/2	33.80	Strom Johnson. Rayfield.		Remy					4.58	R1-R8
3800	1795 2095 3800e	3800	22300	{2345 2345‡ 4600e		(4900	136	33x5	Lincoln	AustC	8-33/6x5				Delco	m-d Own.		m Spicer	,	4.58	RI-TI
8690	9500c	9600			11750 12200		142	35x5	LocomobileSeries 8	Own	6-4½x5½		Ball&B			m-d Own			F Own		
2300g	2785	2785	(2985a 2985c		3585 3985	4285§ 3985	136	32x4½	Marmon34	Own	6-33/4x51/8	33.75	Strom	Delco	Delco	m-d Own	Own	m Spicer	¾F Own	4.10	Rt-R2
2425g	2910	2910	3110a 3110d	,	3710	44108	136	32x41/2	Marmon34	Own	6-33/x51/8	33.75	Strom	Delco	Delco.	m-d Own.	Own	m Spicer	3/F Own	4.10	F1-R2
795	795	p960d	895b 975d		1195	p1585d		31x4	Maxwell	Own	4-354x436		Stewart.				Own	-			
5400 3950b	5600	3950e	3950c	6720	6600e 6720 4850	6810 6900§ 5250	132	33x5 32x416	McFarlan, 1923 Mercer, Series 5	Own	6-434x6 4-334x634	22 50	Rayfieki. Ball&B	West	West	m-d M&E		m Peters m Spicer		3.75	RLR1
1295	3750e 1295	3750e	3750e 1495d	4700 1585e		5000	132 115	32x412 (31x4 30x5	Mercer	Own Y	6-334x5 6-318x414	33.75 23.44	Strom Strom	West, Delco	Eisem Delco	m-d Own s-p B&B	Own Warner.	m Spicer m Spicer	34F Own 12F Tim	3.77 5.10	T2-R2 RLT1
1240	1240	1785	1995c 1995 f 1645c		2585	{2485 {2685§	128	32x41 32x6 33x4	Moon6-58	Cont8 R	6-336x416 6-314x5		Strom Marvel	Delco	Delco.	s-p B&B			1/2F Tim		
915	935	1390	1195d		1890 ∫1445	2190	127 112	34x4½ 33x4	Nash 692-4-5-8 Nash 41-8	Own Own	6-314x5 4-338x5	25.35	Marvel	Delco	Delco	8-p B&B 8-p B&B 8-p B&B	Own Own	m Own m Own	½F Own ½F Own	4.90 4.88	Ri-Ti Ri-Ti
2475	2475 c	(2375 (3150	2485d		1275 13250 13725	3285	130	32x41/2	NationalBB	Own	6-31/2x51/4	29.40	Rayfield.	West	Delco	s-р В&В	B-L	m Univ	F Col.	4.08	R1-R2
2500	2500e	2600e			3500		128	33x5	Noma4C	Cont8 R	6-33/6x41/2	27.34	Zenith	Delco	Delco	е-р В&В.	Detroit	m Spicer	1/2F Tim	4.45	R1-R2
945	915		1095a 1095d	1195	(1345 (1395		113	31x4	Oakland6-54	Own	6-2}{x43/4	19.00	Marvel	Remy	Remy	e Hoos.	Muncie				
750 495	750 495		885d 395g	955 750	1035 1095 795	695d	110	31x4 30x3!4	Oldsmobile6 Overland91	Own	6-23/x43/4 4-31/x4		Zenith Till	Delco	Deleo	э-р В&В э-р В&В			1/2F Own		
2485	695 2485		2650e	3175e	3275	3350d	106	30x312	Overland92 Packard126	Own	4-3½x4 6-3¾x5	19.60	Till	A-L	A-L	s-p B&B m-d Own	Own	m Own	1/2F Own	4.50	R1-R2
3850	3650	2685 3850		4550c	3525 f		133 136 143	33x112 33x5 33x5	Packard "Eight"133	Own	6-336x5 8-336x5	27.34 36.45	Own	A-K Dyneto.	Delco	m-d Own m-d Own	Own	m Spicer m Spicer	12F Own	4.70	R1-R2 F2-R2
2695	2450	2450			3235 2850‡	3235 3435§	131	33x4½	Packard "Eight"143 Paige6-70	Own Cont9 A	8-33/8x5 6-33/4x5		Own Rayfield.	Remy	A-K	m-d Own m-d Long	Warner	m Meen.	12F Tim	4.60	R1-R2
1550	1390 2690	1425 2750	1465d 2260g	2395d 3300	2395 3390 3690	3840 4090§	120 128	32x41/2 33x5	Paterson23-6-52 Peerless23	Cont8 R Own	6-33/8x41/2 8-31/4x5		Strom Ball&B			s-p B&B m-d Own			1/2F Salis 1/2F Tim		
5250	5250	5250		6800	[6900 [70001	(6800 t (7000	138	33x5	Pierce-Arrow	Own	6-4 x51/2		Own			m-d Own			½F Own		
2535	1695 2535	1745 2585d	1745 2635d	2445	2495	3385	126 1263	32x416 32x416	Premier6-50	H-S 90 Own	6-31/2x5 6-33/8x51/2	25.35 27.34	Till Strom	Wagner Delco	Wagner Delco	s-p Hoos. s-p B&B	Muneie Own	m Blood. m Spicer	34F Col. 32F Tim	4.67	R2-R1 R1-R2
	2300 1335	2375	2400c 1545d	3000d	3050 {1885d 1835e	3250 d2185‡	124 120	32x416 32x4	R & V KnightH ReeT6	Own.Kn'gt Own	6-31/2x41/2 6-3/4x5	29.40 24.34	Strom Rayfield.	A-L N.E	A-L N.E	s-p B-L m-d Own	B-L Own	m Spicer m,fOwn.	1/2F Tim 1/2F Own	5.40 4.70	R1-R2 R1-R2
3200e 2685	3200 1485 1635 2485	2685	3200c 2750c	1885e 2035e 3285	4000 1985 2135 (3585	(3585d	131 117 117 128	32x4½ 32x4 32x4 32x4½	Revere	Dues Own Own Cont.12XD	6-4 ⁸ / ₈ x6 6-3 ¹ / ₈ x4 ³ / ₄ 6-3 ¹ / ₈ x4 ³ / ₄ 6-3 ¹ / ₂ x5 ¹ / ₄	23.44	Strom	Bosch.	Bosch	m-d B-L a-p Own s-p Own s-p B&B	Warner	m Mech.	34F Stnd 34F Col. 34F Col. 12F Tim	4.63	R1-T1 F2-T1
{3685 {3785	3485	3800	3650e		(3950§ 4250p 4650p		138 128	32x4½ 32x4½	Roamer6-54-E Roamer4-75-E	Cont.12XD Roch	6-31/2x51/4 4-41/4x6	29.40 28.90	Strom Strom	West West	Split Split	8-p B&B m-d B-L	G-L B-L	f Snead. f Snead	1/2F Tim 1/2F Tim	4.60 4.08	R1-R2 R1-R2
	10900	10950				12850 12900	14314	33x5	Rolls-Royce40-50	Own	6-41/2x43/4	48.60	Own	Bijur	Bosch	e Own	awO	m Own,.	F Own	3.70	RrRa
******	1045				5100 5250	5200 5250		32x4	Rubay	Own	4-23/4x51/4					s-p Own				- 1	
1645 875 985	1645 875 985			2645d	2645		118 108 112	33x4 30x31/2 31x4	Sayers Siz DP Seneca L-2 & O-2 Seneca 50c & 51c	Cont8 R LycKB LycKB	6-38/8x41/2 4-31/2x5 4-35/8x5	27.34 19.60 21.03	Strom Zenith Zenith	Deleo A-L A-L	A-L	8-p B&B 8-p B&B. 8-p B&B	G-J G-L G-L	m Arvae. m Univ m Univ	F Peru F Peru	1.75	R-R2 R-R2
2750 319 r 2250 2700	2750 348s 2250 2700	2750 285g 2450 2850	2425g 2275e 2700e	580 3350e		3985 3450 (4500§	130 102 125 130	32x416 30x316 34x416 34x416	Stanley740 Star Stearns-KnightSKL4 Stearns-Knight6	Own Cont. Spec Own.Kn'gt Own.Kn'gt	2-4 x5 4-31/8x41/4 4-33/4x55/8 6-33/6x5	15.63 22.50 27.34	None Till Schebler. Schebler.	Bijur A-L West West	None A-L A-K A-K	None p Own m-d Own m-d Own	None Warner. Own	None m Spicer f Cli f Cli	1/2F Own 1/2F Tim 1/2F Own 1/2F Own	1.50 1.87 1.50 1.70	R1-R2 R1-R2 R1-R2 R1-R2
1445	1395 2015	1745	2145c	1695d	1995	2385	117 124	32×4 33×4½	Stephens10 Stephens20	Own	6-31/4x41/2 6-31/4x41/2	25.35	Strom	Delco	Delco	в-р В&В	Mech	m Mech.	F Tim	5.10	Ri-Ti
975	2200 995	845g		1225	2700 1550		125 112	32x41/2 31x4	Sterling-Knight Studebaker Light Six	Own.Kn'gt Own	6-31/4x45/8 6-31/8x41/2	25.35 23.44	Strom	West Wag-R.	West Wag-R.	m-d	Own	f Ther	LaF Own	4.55	Ri-R ²
1325 1450g	1350	1750	1100g 1835d	1975d	2050 2550	2750	119 126	32x4 33x4½	StudebakerSpec'l Six StudebakerBig Six	Own Own	6-31/2x5 6-37/4x5	29.40 36.04	Strom Ball&B	Wag-R. Wag-R.	Wag-R. Wag-R.	8-p Own	Own	m Spicer m Spicer	1/2F Own 1/2F Own	4.33 3.70	R1-R2
1995 2450	1995 2790	2640	2315d {2765a 3115e		2550 3490		120 130	32x4 32x4½	Stutz	Weid 690 Own	6-3 ² / ₈ x5 4-4 ³ / ₈ x6	27.34 30.63	Strom	Remy Remy	Remy Delco	e-p B&B m-d War	Warner	m Mech. m Hart.	1/2F Tim 1/2F Own	1.66 3.75	R1-R2 R2-R2
1275	1275	р1565е	1305	1895‡			118	32x4	Velie58	Own	6-34144	24.38	Strom	West	A-K	s-p Dool .	Durston.	m Thie	1/2F Own	4.66	R1-R2
	1690	1990	2190 f 1890d	(2490‡	2285 2490		116 125 120	32x4 32x4 ¹ / ₂ 32x4 ¹ / ₂	Westcott 48	Cont8 R Cont12 X Cont8 R	6-3\8x4\\2 6-3\2x5\4 6-3\8x4\\2	27.34 29.40 27.34	Zenith Rayfield. Rayfield.	Remy Delco Delco	Bijur Delco Delco	s-p B&B s-p B&B s-p B&B	Warner B-L Warner	m Peters m Peters	12F Tim 12F Col.	1.45 4.90	RLR ² RLT ¹
2575	2475			1795 3375‡		{3475 3850§	121	32x4½	Wills Ste. ClaireA-68	Own	8-3½x4		Holley			m-d Own					
1175	2875 1175	2790	1635e		∫1895p		127 118	32x41 32x4	Wills Ste, Claire . A-68 Willys-Knight 64	Own. Kn'gt	8-31/4x4 4-35/8x41/2	33.80 21.03	Holley Till	Delco A-L	Delco A-L	m-d Own m-d Own	Own	m Own,. f Own,.	16F Eat. 34F Own	4.45 4.44	RI-RS RL-RS
3400	3600	1325 3400				1995 {4550 {4700§	124 132	32x4½ 33x5	Willys-Knight 67 Winton 49	Own.Kn'gt Own	4-35/8x41/2 6-33/4x51/4					m-d Own m-d War					

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IndianaPolis, Ind.....Indiana Watkins Mfg. Co.
Kingston, Ont., Watkins Mfg. of Canada, Ltd.
Los Angeles, Cal.......Miller & McIntyre
Memphis, Tenn.....J. B. Cook Auto Machine Co.
New York, N. Y.......Lake Sales Co.
St. Louis, Mo......H. & H. Machine Co.
Syracuse, N. Y., Watkins Mfg. Co. of New York
Toledo, O......Stewart-Burgan Company
Washington, D. C......R-L Motive Parts, Inc.
Waterloo, Ia....All States Rebabbitting Service
Wichita, Kan., Home Office,
The Watkins Manufacturing Co.



ONE-DAY SERVICE

In addition to these convenient factory locations, rebuilt connecting rods are shipped to you the same day they are received at any factory. In your fall overhaul business, you'll appreciate the time thus saved.

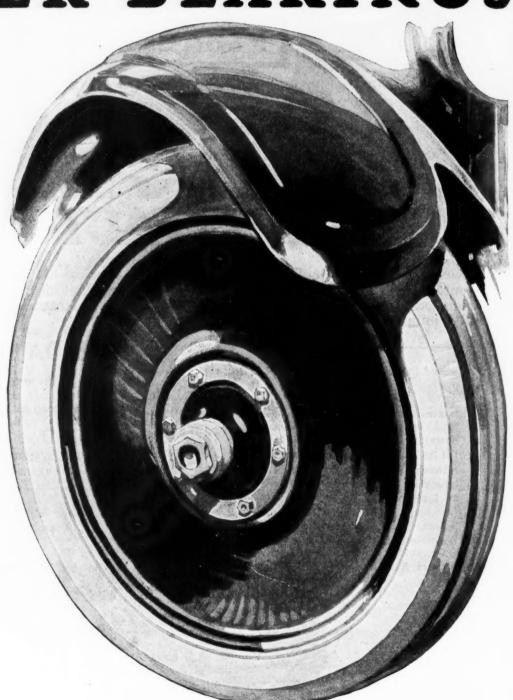
The Watkins System, scientific in every detail, not only rebabbitts connecting rods with guaranteed S. A. E. specification materials but completely rebuilds the rod. New bearings are tinned in and broached to mirror finish. New bolts and nuts, new bronze piston pin bushings and laminated shims are installed.

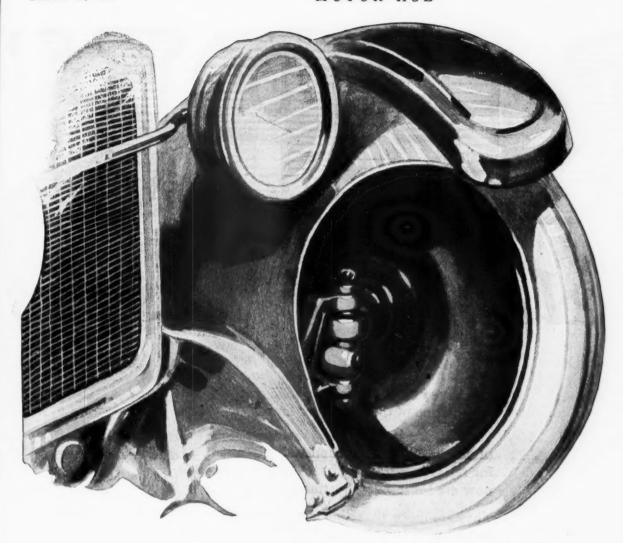
Complete REBABBITTING SERVICE

Once you've tried Watkins One-Day Service, you'll have nothing slower. Write any factory today for catalog price list. It explains several specialized rebabbitting services not obtainable elsewhere.

TIMKEN Tapered ROLLER BEARINGS







In Front Wheels

For so long a time have Timken Tapered Roller Bearings been the dominant front wheel bearings by overwhelming majority that the statement, that the Timken majority is greater today than ever before, is not at all surprising.

Through their dual capacity of successfully sustaining not only the radial loads at this location, but also all thrust loads, and all resultant loads, and by virtue of carrying more load than other bearing types, per unit of space required, Timkens greatly simplify front wheel mountings—a more important sales factor than mere numbers and dominance.

And when, after many, many miles of service, anything but the initial true alignment and fine fit in the front wheel mountings would be dangerous, Timkens can be adjusted to function as when new.

The Timken Roller Bearing Co

Wellow Chassis

We have been users of Republic trucks for a period of three years or more.

Each truck ran for over a year after date of purchase without our spending a cent for repairs. What repairs are necessary now are for minor adjustments only.

They are more than satisfactory on gas and oil consumption. Our upkeep costs in this respect are so light that were we to give you the exact figures, we believe the average truck owner would doubt our integrity.

Needless to say, we are more than satisfied with our Republics.

BISHOP & COMPANY Seattle, Wash.

TRACTIONS ERECTORS FARMERS CLEANERS ALL LINES COUNTIES REFINERIES MOVIES

BIJO

Republic trucks have started as the "flywheel" for many a passenger car business, and soon have become the major part of the business.

When public whims, or an "off" model, or any of a number of superficial factors are operating against the sale of some particular passenger car, Republic trucks still sell on the sound basis of greatest measurable dollars-and-cents value. Business reasons—their yield of profitable haulage sells Republic trucks.

The proof behind them is not merely a dealer's sayso, but the success records of hundreds and thousands of Republic trucks, at work in all the branches of industry, in every state; and in many countries.

Few trucks are able to reinforce your selling pressure so strongly because very few trucks compare with Republic in extensive national and world-wide use. Republic has marketed more trucks than any exclusive truck maker.

And the appeal of the Republic line is as nearly universal as possible with the five improved Republic models—to meet every need efficiently.

The Republic line, at today's prices, sponsored by a virile, soundly established organization of intimate Republic experience, affords Republic dealers all the elements of profit and progress. The opportunity to obtain a leading franchise such as this is rare. You will want the details, no matter what lines you now handle.

REPUBLIC MOTOR TRUCK Co., INC., Alma, Michigan More Trucks in Use than any other Exclusive Truck Builder

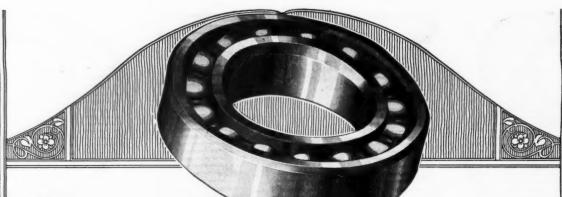
Trucks



HATTERS

GARAGES

EVERY FIELD



New Departure Ball Bearings

Longer Life—with Less Attention The Keynote for 1924

TUDY the mechanical refinements of the many new models just announced. Note that the outstanding aim of almost every change or improvement is to increase the life of the car as a whole.

Even innovations which are featured as conducive to the comfort of the passenger are basically a means of increasing car life.

HOW THIS APPLIES TO BEARINGS

Oil and grease must reduce wear in some places. Adjustments must still be made where wear is inevitable. But in really efficient anti-friction bearings (whose performance is worthy of that name) wear is unnecessary.

Because of the correct application of the ball principle and almost unbelievable precision and a special adaptation of electric furnace high carbon high chrome alloy steels, New Departure Ball Bearings do not wear appreciably during the life of the car.

Think what this means to the car owner! It eliminates at once one difficult adjustment which in other types of bearings is an everpresent source of uncertainty. It reduces the major worries to keeping the battery

supplied with water and the engine with water, oil, and gas, and the grease fittings with grease.

WHAT IT MEANS TO GEARS

Authorities tell us that the original setting of gears, once obtained should never be altered, because each change causes the teeth to wear in a different position. Ball Bearings, because they do not wear, naturally maintain the setting of the gears. But if a type of bearing is used that must be taken up periodically—how can the gears they support and locate possibly retain their original setting unimpaired?

New Departure Ball Bearings are the ideal in every position because they are an important factor in the attainment of longer life in automotive construction.

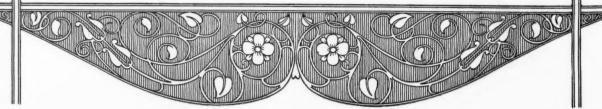
THE NEW DEPARTURE MANUFACTURING CO.

Bristol, Connecticut

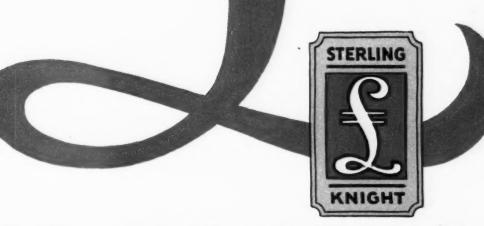
Detroit

56 Victoria Street, London, S. W. 1

Chicago



STERLING KNIGHT



SIX CYLINDER
KNIGHT-TYPE
Motor Cars

Like the Gift of Song

Like the gift of song with which great singers are born, the Knight motor has something inherent—something the greatest engineers cannot build into ordinary motors.

And, just as a singer's natural gift needs the guidance of great artists—so too the skill of a great artist is needed to develop to their utmost even the natural gifts of a wonderful motor.

Mr. J. G. Sterling has long been known as the dean of artists among Knight motor designers. Prior to three years ago he was with the company who then produced a four cylinder Knight motor generally adjudged to be the best Knight motor of that time.

The Sterling-Knight six — the development of Mr. Sterling's more matured abilities—naturally stands out as the acme of Knight motor perfection. Among the unusual features of this motor's construction, is the seven bearing crank shaft. This assures greater rigidity and vibrationless performance.

Linked with the mechanical perfection of the Sterling-Knight motor and chassis, is rare distinction and beauty of body design. Each of the Sterling-Knight body types possesses an individuality that is exclusively its own. Each is complete in appointment and perfect in finish.

The Sterling-Knight Company is soundly financed and is operated by men who are known throughout the automobile trade for their integrity, ability and fair-minded business policies.

This car stands alone in its price class. For that reason it can be handled in conjunction with almost any other line of cars. Dealer contracts are being made now. Deliveries this month.

STERLING-KNIGHT SPECIFICATIONS

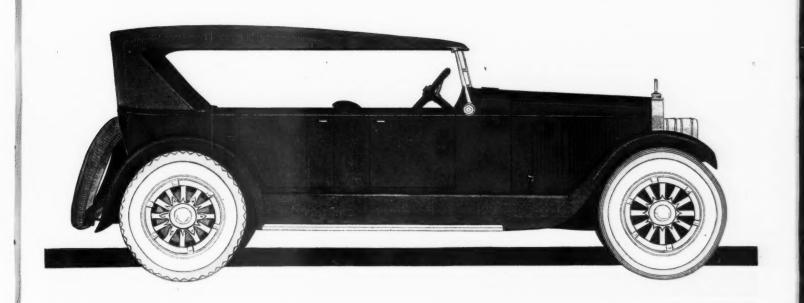
Motor Cylinders	Knight-type—six cylinder Bore 31/4-inch, stroke 45/8-	Springs	Semi-elliptic, front and rear; length of front, 39 inches; rear, 58 inches; width 2
Horsepower	inch, 6 cast en bloc. S. A. E. rating, 25.35 horsepower. Block test shows 50 horsepower.	RUBBER SHOCK INSULATORS	inches. These patented devices replace the usual shackle and spring bolt construction.
Crankshaft	Seven bearings; insures greater rigidity.		They require no attention during the life of the car.
ECCENTRIC SHAFT	Seven bearings.	CLUTCH	Multiple disc clutch.
Lubrication	Pressure Feed.	Transmission	3 speeds forward and reverse; selective type with thief-
TIMING CHAINS	Morse, adjustable.		proof transmission lock.
VALVES	Knight, sleeve-valve type.	STEERING GEAR	Worm and gear irreversible
Design	Material, timing, operating and oiling devices have been especially developed for this particular engine.		type; American walnut all wood steering wheel with finger tip spark and throttle control.
Ignition	Westinghouse distributor and coil.	Axles	Timken front; Timken semi- floating rear.
STARTING AND LIGHTING	Westinghouse 12-volt, 2-unit.	Brakes	External service and internal emergency. Drums 15½ inches diameter.
Cooling	Thermo-syphon, cellular type radiator, capacity 4½ gallons; self-oiling fan.	WHEELS TIRES PAINTING	Artillery type. 32 x 4½ Cord. Body—Sterling blue; fen-
FRAME	Pressed steel—side channels 6 inches deep.	WHEEL BASE	ders, black enamel. 125 inches.

STANDARD EQUIPMENT

Electric starter, generator and storage battery; speedometer and clock; complete electrical lamp equipment; non-glare lense; Spartan motor-driven horn; tool roll with complete equipment of tools; one-ton jack; rear tire carrier equipped for additional tire; one extra rim; moto-meter, reserve gasoline cock and gauge; wood wheels. Steel disc wheels optional at an additional charge.

Built By

THE STERLING-KNIGHT COMPANY, WARREN, OHIO



THE STERLING KNIGHT five Passenger Phaeton

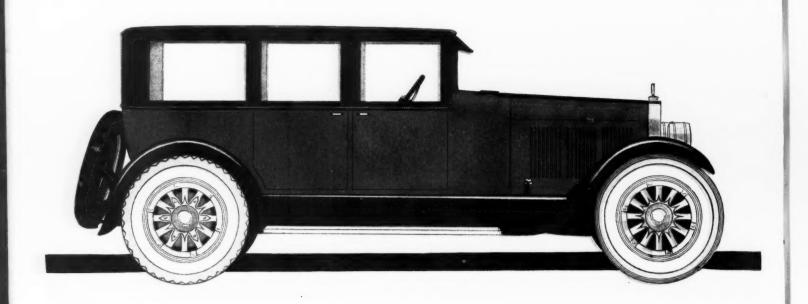
\$1985 at Warren, O.

THE first glance at this car brings an immediate appreciation of unusual body design and striking beauty.

No measure of comfort has been neglected, doors are wide, seats are deep and restful and road shocks are minimized by long, flat, resilient springs and rubber shock insulators.

All Sterling-Knight cars are equipped with the wonderful Sterling-Knight motor. This precision-built, six cylinder sleeve-valve motor has rightfully been called "the motor that gets younger as it grows older."





THE STERLING KNIGHT five Passenger Sedan

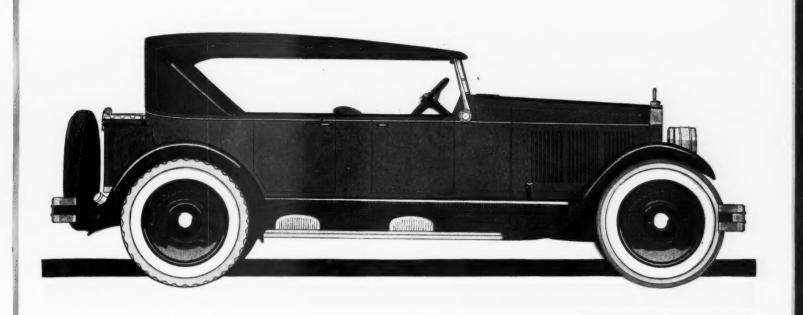
\$2800 at Warren, O.

THE hidden details of superb workmanship that mark all Sterling-Knight cars are especially appreciated in the sedan. Perfectly fitted sills of ash prevent squeaks and rattles, even after years of service. Doors and glass are close fitting, well mounted and free moving. Deeply upholstered seats are low and restful.

There is plenty of room—all Sterling-Knight models are designed that way. The deep, commodious tonneau accommodates three—and luggage, too, without the slightest cramping.

In addition to the regular equipment this sedan is equipped with a Perfection Heater to assure year 'round comfort.





THE STERLING KNIGHT Four Passenger Sporting Type

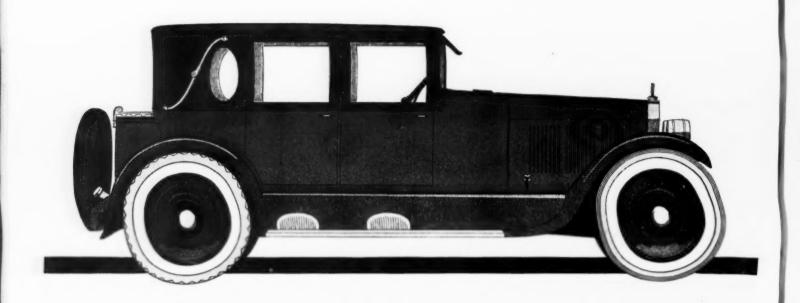
\$2200 at Warren, O.

MERE glance at the illustration suffices to show the beauty of this new sporting type. Its long, low, rakish lines inspire the admiration of the most critical. Its finish is the finest that the progress of the art allows.

While essentially a sporting car, this Sterling-Knight does not exceed the bounds of conservatism needed to give the car popularity over a long period of time.

In addition to the regular equipment, this sporting type has a spare cord tire and tire cover, front and rear bumpers, windshield side wings, automatic windshield cleaner, rear view mirror, built-in suit-case carrier equipped with two suit cases and aluminum toe plates.





THE STERLING KNIGHT

Jour Passenger Brougham

\$2750 at Warren, O.

COMFORT, beauty and good taste are outstanding features of this perfectly appointed closed car.

While strictly a four-passenger car, it is designed not only with ample leg room in front but also with an eye to the comfort of those who ride in the rear seat. There is nothing cramped about it—no deliberate waste of space.

You will find in this four-door brougham a freedom from noise that appeals especially to men and women who prefer closed cars. In addition to the regular equipment, the brougham has a built-in suit-case carrier and two suit cases, automatic windshield cleaner and Perfection Heater.





Sioux Valve Seat Reamer Set

No shop equipment is complete unless it includes this time-saving, labor-saving and profitraising set.

It's a complete outfit for practically all reseating jobs. Comes complete in box. Set consists of 10 Sioux Valve Seat Reamers and 4 Pilot Stems as follows:

1½ inch 45°	1	13/4 inch 30°	2	inch	. 45°	2½ inch 45°
$1\frac{5}{8}$ " 45°		13/4 " 45°	21/8	8	. 45°	PILOT STEMS
15/8 " 45° 15/8 " 30°		17/8 " 45°	21/	4	. 45°	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Jobbers Everywhere Sell Them

Write for Catalogue and Valve Seat Reamer Specifications
ALBERTSON & CO. SIOUX CITY, IOWA

"The Well Equipped Shop

Gets the Business"



rro TRANSMISSION AUXILIARY

Warford adds to Ford truck sales on the sure basis of giving the 2-ton market the benefit of Ford truck value, Warford on the Ford puts 2-ton haulage on the lowest tonmile cost basis; yet yields the finest kind of 2-ton truck ability. Warford with six speeds forward [modern selective gear type] provides an UNDERDRIVE which no truck can outpull. And Warford OVERDRIVE permits economical fast running at easy engine speeds. Warford is as good as the transmissions of the very costliest trucks. Dealers do succeed splendidly in the 2ton field with Warford, Write

The Warford Corporation 44 Whitehall Street, New York

AUBURN, N. V. Foster-Warford Co.

CANTON, Ohio CANTON, Ohio
Dine-De Wees Company
400 Walnut Ave., S. E.

MEMPHIS
Continental Body Co.
476 Union Ave.

Houdaille-Polk Co. 2218 Commerce St.

DAVENPORT, Iowa

DENVER, Motor Specialties Company 17 W. 13th Avenue

MINNEAPOLIS McGee White Corporation E. W. Jay 1311 Hennepin Ave.

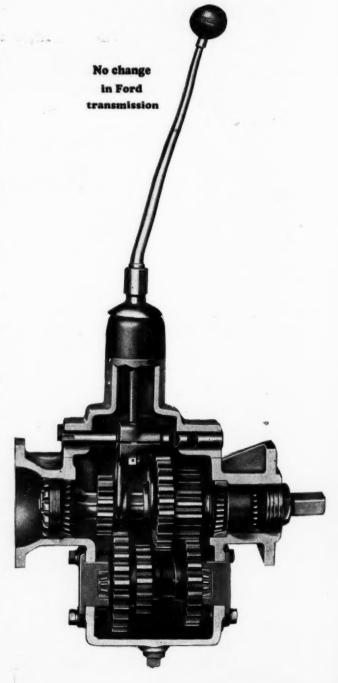
NEW YORK Motive Parts Corporation 796 10th Ave.

Warford-Pacific Co. 1111 Post Street

STOCKBRIDGE, Mich. Transmission Sales Co.

VANCOUVER, B. C.

WICHITA, Kans. Price Auto Service Co. 301 S. Topeka Ave.





You sell Wedford "Air-tites" in a handy, special metal box container—5 to the box, for 30 cents—arranged in the box so that each core lies in a separate groove—protecting the threads. Twenty packs of five each (100 cores) in a neat

the valve cores that keep tires tight!

Wedford "Rid-Ged Grip" Steering Wheel Tire

Keeps hands warmer in winter—cooler in summer. Hands or gloves will not slip. Adds to appearance of the wheel.



Wedford "EVR-KLEAN" Seat Pads

Protect clothes. Fit any automobile seat. Used in enclosed cars and open. Winter and summer.



Wedford "Anti-Rattlers"

Prevent rattling and squeaking of enclosed car windows. Also extensively used on house and public building windows.

Motorists by the hundreds of thousands want freedom from leaky tire valves. They're tired having tires get "soft" on the road. Tired making frequent stops for air. They want protection against the loss of paid for tire mileage in their expensive "cords." They want to be safe from under-inflation—"softness" that can't be detected by the eye. They want valve cores that don't leak:—Wedford "Air-tites."

The internal spring construction, and uniform spring tension, of Wedford "Air-tites" keeps the valve closed tight-under low air pressure or high. It doesn't leak! Moreover, it takes the air faster than ordinary cores due to the extra large air intake passage.

Wedford "Air-tites" fit all standard tire valve stems, regardless of the tire size. They are easier to insert. Will not "freeze" in the stem. Supply your valve-inside customers with Wedford "Air-tites." Order from your jobber's salesman. If he cannot supply you, write us direct.

"A Wedford Product Always Sells"

The Wedler-Shuford Company

St. Louis, Missouri



Fanwise Construction - showing how the layers of fabric are built up, leaving the strands of fabric in each layer running in a different direction.

Oct

too great for this

Fanwise Construction—exclusive feature of the Thermoid-Hardy Universal — enables it to withstand tremendous stresses

> Strength to withstand a torsional twist of 21,000 pounds-endurance to go 60,000 miles on the heaviest trucks, over roughest roads-flexible enough to eliminate "whipping" and to deliver a smooth, even flow of power.

> These are the qualities which have caused 66 leading manufacturers of passenger cars and trucks to adopt the Thermoid-Hardy Universal Joint as standard equipment. And the thing that has made these qualities practical is the basic patent on Fanwise Construction.

Equal stress at every point

Look at the diagram above—it clearly shows the vital importance of Fanwise Construction. Notice

how the strands in each layer of the Thermoid-Hardy disc run in different directions. This results in an even stress at every point—an equal strain between every pair of bolt holes.

This patented construction is responsible for the enormous strength of the Thermoid-Hardy fabric disc. It holds the drive-shaft in true on every revolution.

Without Fanwise Construction, the fabric disc would stretch out of true and allow the shaft to fly off-center two or three times per revolution. This happens to the ordinary fabric disc. And the resulting 3,000 to 4,500 jarring vibrations mean constant damage to the delicate gears and bearings in a car.

Thermoid-Hardy discs are now packaged for distribution through jobbers and dealers for re-placement sales. Full information, prices, and discounts sent on request.

A book you should have

We have prepared a book, "Universal Joints—Their Use and Misuse," that treats the subject from every angle—the mechanical principles, construction, lubrication, manufacture, strength, tests, and records of performance. Send for your copy today.

THERMOID RUBBER COMPANY

Sole American Manufacturers

Factory and Main Offices, Trenton, N. J.

New York Chicago Seattle Kansas City London Los Angeles Detroit Atlanta Boston Cleveland San Francisco n Paris Turin

IHERMOID-HARDY UNIVERSAL JOINT

Makers of "Thermoid Hydraulic Compressed Brake Lining" and "Thermoid Crolide Compound Tires"

LIST OF USERS

LIST OF USERS

E. A. Nelson Automobile Co.
Nelson Motor Truck Co.
D. A. Newcomer Co.
O'Connell Motor Truck Co.
Oliver Tractor Co.
Oliver Tractor Co.
Oneida Motor Truck Co.
Packard Motor Car Co.
Packard Motor Car Co.
Patriot Motors Co.
Reliance Motor Truck Co.
Reliance Motor Truck Co.
Reliance Motor Truck Co.
Reso Motor Car Co.
Reynolds Motor Truck Co.
Southwark Fdy. & Mach. Co.
Southwark Fdy. & Mach. Co.
Studebaker Corp.
Studebaker Corp.
Studebaker Corp.
Studebaker Corp.
Studebaker Corp.
Tamplar Motors Co.
Townotor Co.
Townotor Co.
Traffic Motor Truck Corp.
Transport Truck Corp.
Transport Truck Corp.
United Motors Co.
Walter Motor Truck Co.
Walter Motor Truck Co.
Ward La France Truck Corp. Inc.
Geo. D. Whitcomb Co.
Wichita Motors Co.
H. E. Wilcox Motor Co.
Willys-Overland, Inc.
Zeitler & Lamson
Truck & Tractor Co.
Worthington Pump & Machinery Co.

No strain flexible joint

LIST OF USERS

Allis Chalmers Mfg. Co.
The Autocar Co.
Available Truck Co.
Barley Motor Car Co. (Roamer)
Chandler Motor Car Co.
Crow-Elkhart Motor Corp.
Jas. Cunningham Son & Co.
Dart Truck & Tractor Corp.
The Dauch Mfg. Co.
Diamond T Motor Car Co.
Doane Motor Truck Co.
Fageol Motors Co.
H. H. Franklin Mfg. Co.
Garford Motor Truck Co.
Garford Motor Truck Co.
Hankley Truck Co.
Hendrickson Motor Truck Co.
Holt Mfg. Co.
Indiana Truck Co.
International Motor Co.
Jackson Motors Cop.
Kelsey Motor Co.
Lexington Mfg. Co., Inc.
Lakewood Eng. Co.
Lexington Motor Co.
Lexington Motor Co.
Lexington Motor Co.
Maxwell Motors Cop.
Menomine Motor Truck Co.
Mercer Motor Co.
Mercer Motor Co.
Mercer Motor Co.
Mercer Motor Co.
Maxwell Motor Co.
Maxwell Motor Co.
Menominee Motor Truck Co.
Mercer Motors Co.

LIST OF USERS



The Book of Profits

"What Car Do YOU Drive?" is a real best seller for dealers everywhere. It contains facts, not fiction, and all of these facts mean profits to the dealer who uses them right. For "What Car Do YOU Drive?" gives at a glance the Snap-on Interchangeable Handles, Sockets and Attachments to select for a complete Kit or for any servicing job for any make of car—the key to success with Snap-ons.



You Need This Book NOW!

You ought to have been selling Snapons long ago, because car owners, mechanics, truck and tractor owners all want them and buy them when they see them—if not the first time, then as soon as the need for socket wrenches arises. And because you can sell Snapons in selected Kits containing just the

right tools for any individual car, your profits are greater than they could possibly be with any ordinary socket wrenches. There are many other things about Snap-ons that will appeal strongly to you if you know them—write us today for full details.

MOTOR TOOL SPECIALTY CO.

14 E. JACKSON BLVD., CHICAGO

SNAP-ON WRENCH CO., MANUFACTURERS
Milwaukee, Wisconsin

Snap-on

INTERCHANGEABLE

Socket Wrenches

"The Greatest Service From the Fewest Tools"



TIRES BATTERIES

Best to sell or buy

There, in five words, is the secret of the success of every dealer in Cooper Products, which are Cooper Cords and Cooper Batteries. The consumer finds them the best to buy, and because of this, and other things, the dealer finds them best to sell. The other things are quality and workmanship that reduce personal selling effort to a minimum, the guarantee of a corporation sufficiently powerful to make good any reasonable promise, and a good battery-good tire combination

that assures year'round profits, a steadily growing repeat business, and enviable prestige. Here is something worth knowing more about, and a letter or post card will bring that opportunity.

THE COOPER CORPORATION

CINCINNATI, OHIO



ANNOUNCEMENT



Sheldon V. Wood

Although we were granted a registration on our Red Devil trade mark about eight years ago and have been using the name ever since, we now find that registration had been granted to another manufacturer a number of years before. Under the circumstances we consider it business courtesy to relinquish any claim we have to the name. In doing so we realize that the name Red Devil has become synonymous with Dolly Jack throughout the automotive trade and we ask you to bear in mind that the change is in name only.

To avoid confusion in the future we are also changing our company name from Mid-West Manufacturing Company to Wood-Imes Manufacturing Company. There is no change in personnel, policy, organization or products. Again the change is in name only.



Carl E. Imes

Ulood-ImesProducts FORMERLY RED DEVIL

The products affected by this change have been known as the Red Devil Dolly Jack, the Red Devil Quick-Lift Tire Changing Jack, the Red Devil Self Aligning Burnishing Machine and Red Devil Burnishing Compound. In each case "Wood-Imes" will be used in the future instead of "Red Devil". The products remain the same. Mr. S. V. Wood, President, and Mr. C. E. Imes, Secretary-Treasurer are responsible for the establishment, growth and policies of the business and are now giving the firm a more personal identity by the strength of their names.

WANUFACTURING COMPANY

FORMERLY MID-WEST MFG. CO.

Minneapolis

Minnesota

Octob

M

ONLY

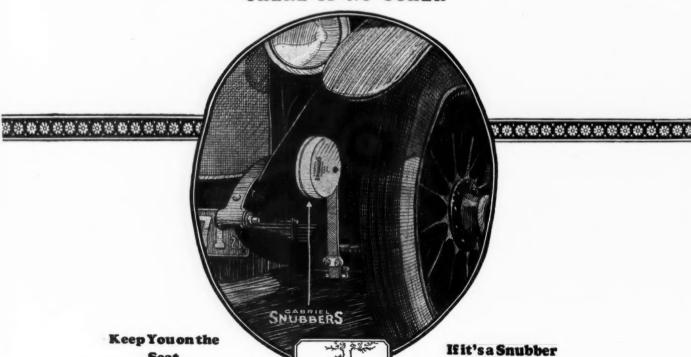
Manufacturers of passenger cars who produce 1000 or more cars a year do not standard-equip with Gabriel Snubbers or put holes in frame for them.

Manufacturers do

Sold by legitimate dealers

GABRIEL MANUFACTURING COMPANY 1415 East 40th St. Cleveland, Ohio

IS NO OTHER



Keep You on the Seat Save Your Car

-it's a "GABRIEL"

Millions of Ford Owners Are Reading These Big Ads



Here's the biggest value ever offered Ford owners? Type 600 is a wonderful new Ignition System-big, de-pendable, efficient, waterproof-

It is not just a Timer-but a complete igniti just a Timer—but a complete ignition system ecially for Fords by the makers of the worldfamous Bosch Magneto-

It makes a wonderful improvement in Fords-insu quick, easy starts, more power on the hills, smooth run-ning under all conditions.

Has automatic spark advance — keeps plugs clean.

You get your money back in thirty days if you're not satisfied. AMERICAN BOSCH MAGNETO CORP. Box P823 Symposium Mag.

Send this Coupon for Special Trial Offer

in the Saturday Eve. Post Literary Digest and other nationals



"Cash-in"

A big advertising campaign on the wonderful new Bosch-Ford Ignition System is now in progress.

Millions of Ford owners are being reached through large ads in the Saturday Evening Post and other prominent nationals. Tremendous interest is being shown-thousands of inquiries are pouring in, and dealers are reporting phenomenal sales.

Tell the Ford Owners in your town that YOU sell the Bosch Type 600 System. Lay in a good stock, put in a window display-take full advantage of Bosch

Don't let your competitor beat you to it. Be quick-

Wire-or mail the coupon TODAY.

Mail This Coupon TODAY

	AMI	ERI	CAN	BOSCH	MACN	IETO	CORPORATION
V.	60th	St.	5810	Sprin	ngfield,	Mass.	CORPORATION

- Springfield, Mass.

 New York

 Detroit, Mich.

 Send me a Bosch Type 600 System at dealer's price C. O. D.

 also list of your distributors.

 Springfield, Mass.

 Chicago, III.

 San Francisco, Cal.

 San Grandisco, Cal.

 Type 600 System, Type 600 Sy
- Firm Name . Street Address

City ..

Date

State.

Signature..





THE "U. S. Automatic"—a quarter inch portable electric drill that weighs only 53/4 pounds—can do a drilling job through metal as fast as any of its biggest brothers.

Holes up to $\frac{1}{4}$ in. in steel all look alike to this little gogetter—"U. S. Automatic" that gets 'em all.

And think what a cinch it is to operate—so light, so powerful, so easily controlled. The switch-in-the-handle is an innovation that makes this drill about the easiest in the world to start and stop—and makes an extra grip support when the drill is running.

If you've got a shop, and have holes to drill, you want to know about this "U. S. Automatic." Just write for circular, and for catalog 20-C.

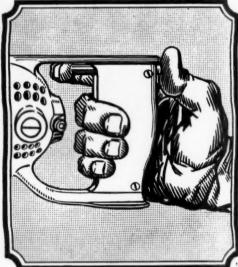
The UNITED STATES ELECTRICAL TOOL CO CINCINNATI, OHIO.

District Sales Offices and Service Stations

Boston Chicago Clevelan Columbu Detroit

Houston Kansas City Milwaukee Minneapolis New York Philadelphi: Pittsburgh St. Louis Toledo

Complete stocks carried in all service stations

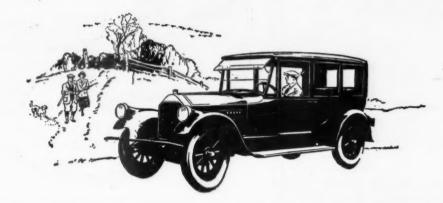




UNITED STATES
Portable Electric
DRILLS



PIERCE



THE ENCLOSED DRIVE LIMOUSINE

In all their history, Pierce-Arrow dealers have never prospered so greatly as they have this year — and many of them have been selling Pierce-Arrow for ten, fifteen and even twenty years.

For one thing, owners everywhere are saying that Pierce-Arrow is building the greatest car in twenty-two years of successful manufacture. Another factor is the Pierce-Arrow advertising and merchandising campaign, the most ambitious in the history of the company.

In a certain few territories the valuable Pierce-Arrow franchise is available. We invite correspondence on the subject.

THE PIERCE-ARROW MOTOR CAR COMPANY

Buffalo, N. Y.

□PIERCE-ARROW >

Open Cars \$5250 Closed Cars \$7000
At Buffalo—Government Tax Additional

ARROW

"PRIDE OF ITS MAKERS MAKES YOU PROUD IN POSSESSION"

The Ring That Forces Lubrication

The beveled edge does it. Oil is collected on the upstroke—increasing compression forces it into the inner groove which holds oil safely at top of stroke. This action prevents its entrance into combustion chamber.

Oil is again distributed over cylinder walls on down-stroke of piston, forming an oil seal between groove and cylinder. Compression leakage is prevented and perfect lubrication is provided.

Positive forced lubrication takes place-

A wonderfully efficient ring furnished in either ground or turned finish.

Universal Hy-Grade Plain Ring

This low priced quality ring is a popular seller. It gives you a quick turn-over and has been used by the motoring public with unfailing success.

Made from best material with a carefully peened interior circumference.

Furnished in either ground or turned finish, this low priced dependable ring moves fast and provides a quick profit. A ready, consistent seller.

DEALERS: Universal Rings have proved their superiority and are backed by abundant advertising and sales help. A real line and a real profit.

Jobbers: Write for our attractive proposition. It will interest you.

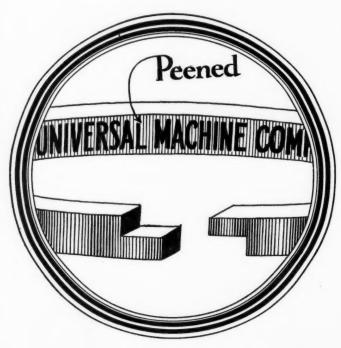
UNIVERSAL MACHINE COMPANY

Baltimore, Md.

Bevel Edge Groove Ring



Hy-Grade Plain Ring



UNIVERSAL ONE PISTON RING



Sam Doesn't Say Much But— The Card Says a Bushel

Sam Simms, who runs a garage in an upstate town in New York, has a "Safety First" scheme that's all his own.

When he notices that the brakes on a customer's car don't work just right Sam drops him a hint: "Safety First-Better let me line those brakes of yours with TESTBESTOS."

Once in a while the customer thinks he knows better. "Oh, I guess my brakes work well enough. I'll risk it."

"You're the doctor," says Sam. "But before you go-I promised my friend Smithers I'd give you this card, just in case-" Sam fishes a card out of his pocket, and the customer reads:

WM. J. SMITHERS, Funeral Director

It's sort of rough on the customer's sensibilities, but Sam gets lots of re-lining jobs.

AYBE Sam carries the joke a little too far, but keeping your eye on your customer's brakes is part of the good service you owe him. And besides, it will mean more jobs in your shop and more money in your pocket.

And if you make every one of those relining jobs a TESTBESTOS job you are giving the car owner the best accident insurance money can buy.

Do you know TesTBESTos, the Brake Lining that is made of extra long fibred asbestos, woven and interwoven with a base of the toughest of brass wire, and specially proofed against heat, friction, oil, gas and grease? If you don't know it, will you try it at our risk? See the Guarantee that covers every foot of TesTbesTos.

AMERICAN ASBESTOS COMPANY, Norristown, Pa.

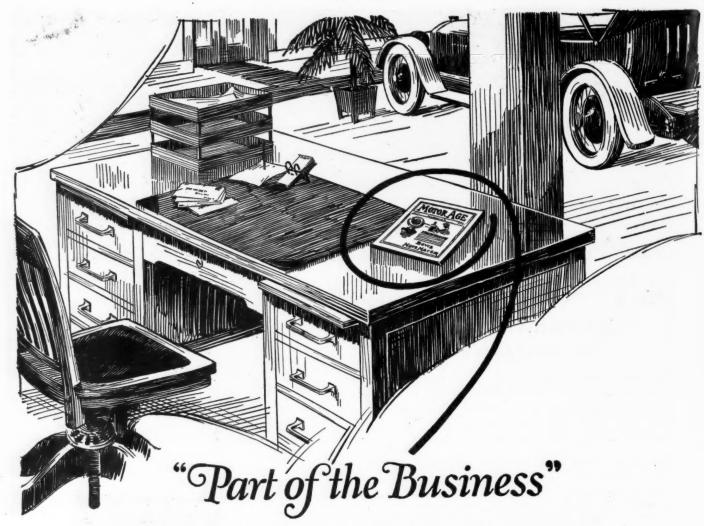
BRAKE INSPECTION YOUR PROTECTION

THE TESTBESTOS GUARANTEE If any piece of Testbestos Brake Lining fails to give absolutely satisfactory service, return it to us and we will send you a new piece without

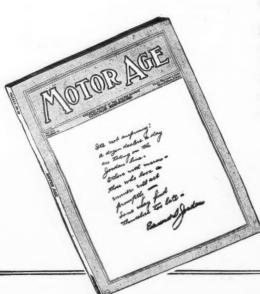
AMERICAN ASBESTOS CO. Norristown, Pa.

Please send me the name of the nearest TESTBESTOS jobber.

Address



I F an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.



MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.

MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.



Adjustable Hack-saw Frame with pistol grip

No. 247

Price \$3.60

An easy-to-use hack saw



Hack-saw Blades All Hard

Flexible Hack-saw Blades with soft center

No. 888 No. 777

THE pistol grip handle fits snugly in the hand and is so hung that the wrist comes almost directly behind the blade, making sawing easy and blade breakage less frequent.

Made of first-grade round-edge steel. Frame is adjustable from 8 to 12 inches. Very rigid, being made of \(^1/4\x3^4\)4 inch steel with extra heavy back. Fully polished and nickel plated.

Black composition handle is molded in a single piece. Depth of throat 3½ inches. One blade furnished with each frame.

As to blades the Goodell-Pratt line offers a wide assortment of all hard as well as flexible blades.

The all hard blades are made of high-grade, hot-rolled sheet steel, hardened and tempered to just the right degree.

The flexible hack saw blades are made of the same grade of sheet steel, with hardened teeth and back, but soft centers to withstand severe twists and side strains.

Other Goodell-Pratt Tools

No matter what the nature of your work, you will find in the Goodell-Pratt Catalog No. 15, many tools that should be a part of your equipment. The catalog is free to you. Send for it.

GOODELL-PRATT COMPANY, Greenfield, Mass., U. S. A.

Toolsmiths

GOODELL-PRATT
1500 GOOD TOOLS

There are good reasons why this plug sells for a trifle more than ordinary plugs—and here they are:



Ford owners everywhere know AC's reputation as a spark plug maker.

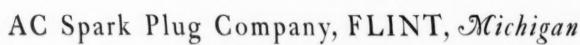
They know that AC's have been proved best in open competition between racing cars, speed boats and airplanes.

National advertising is showing Ford owners the many features of the AC 1075, which make it a better plug for Ford engines.

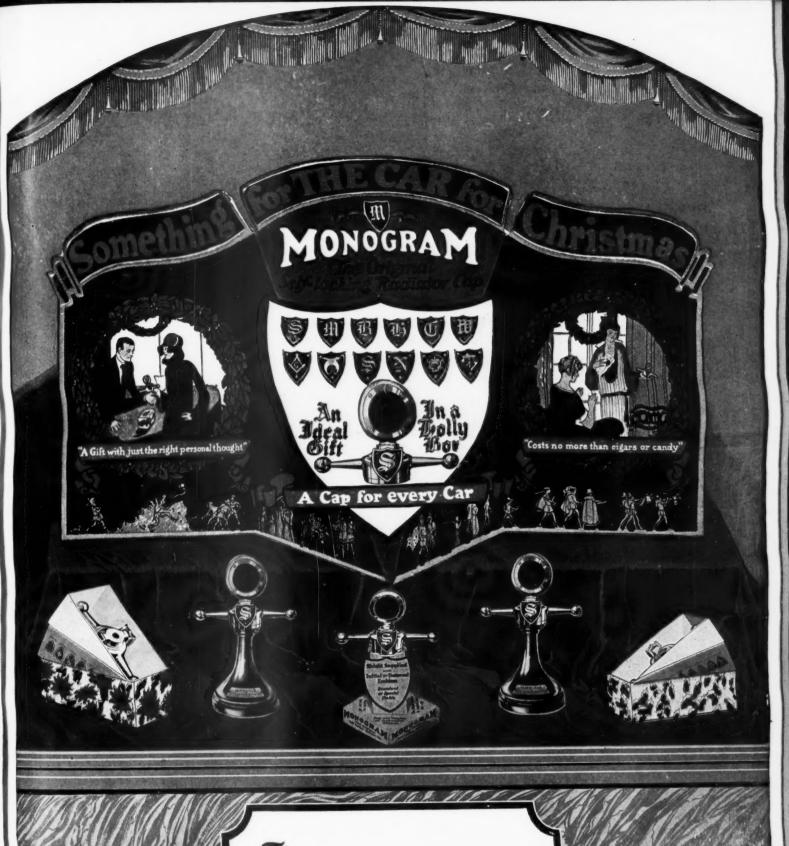
Ford owners are easily sold AC1075's when shown their special features—and you make a larger profit on them than on plugs ordinarily sold for Ford engines.



The AC Plug Kit is something the motorist has always wanted to carry his spare plugs. It helps you make four sales instead of one. It is just one more thing that makes AC's easier to sell and consequently gives you a better profit.



Makers of AC Spark Plugs—AC Speedometers
U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending



nside they come, when they see this supersellengine in your window, bringing Christmas profits.

What brought them in front of the window? Turn the page and see.







LEARN AUTO MECHANICS IN EIGHT WEEKS BY SWEENEY SYSTEM OF PRACTICAL EXPERIENCE

The world's greatest trade school, the largest institution of schooling neither endowed nor supported in whole or part by the state or city, is the Million Dollar Sweeney School at Kansas City. For 15 years this School has been teaching students from all parts of the United States and from practically all foreign countries a thoro, practical course in Auto Mechanics and the actual success of over 60,000 graduates, 20,000 of them in business now for themselves proves that Sweeneys is to the mechanic what West Point is to the soldier.



Sweeney System of Practical Experience

The Great Million Dollar School, world famous, and the success of my thousands of graduates are due to the Sweeney System.

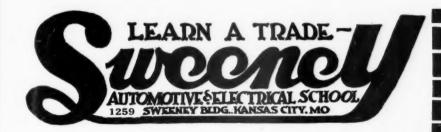
This is what you get here and can't get anywhere else. I have taught 60,000 men to be expert repair men, chauffeurs, tractor engineers, etc. I am proud of the fact that I was selected by the U. S. Government to train 5,000 men for mechanical work in the service. I teach by using tools, not books. You learn as you do the real work with your hands.

The Sweeney School covers 12 acres of floor space. The building is ten stories high and every foot is devoted to teaching of Automobile and Tractor business. It is filled from top to bottom with tens of thousands of dollars' worth of gas engine equipment for you to work on and there are scores of expert instructors to help you learn. We even own a magnificent, fully equipped farm—our tractor farm—in order to exactly reproduce the conditions under which tractor engineers and farm machinists must work.

Big FREE CATALOG and Special Offer

Get my big FREE catalog. It shows hundreds of actual photographs of men at work in my magnificent new school. Tells all about wages, profits, opportunities in auto and tractor business. Explains step by step how you learn. Interesting letters from graduates telling how they made good. Shows how men come from all over the world to this big school. Makes you want to join the crowd. Tells everything you want to know. I will gladly send you a copy beautifully illustrated. No colored students accepted.

EMORY J. SWEENEY, President.



For Big Offer and Catalog Mail this Coupon

Emory J. Sweeney, President, Dept. 1259, Sweeney Bldg., Kansas City, Mo.

Send me your big Free Catalog and full details of the Sweeney eight weeks' course.

me

Address

Advertising Made to Serve You

Merchandise lives or dies as it does or does not meet a human need. Advertising is subject to the same law of service. The real measure of its value is what it gives, not what it gets.

But you are not interested in *all* advertising any more than you are in all merchandise. That is one big reason why you have a highly specialized Business Paper in your field such as the one carrying this advertisement.

LIST OF MEMBERS

Each has subscribed to and is maintaining the highest standards of practice in its editorial and advertising service.

Advertising and Selling
American Architect & Architectural
Review
American Blacksmith, Auto & Tractor Shop
American Exporter
American Funeral Director
American Hatter
American Machinist
American Paint & Oil Dealer
American Printer
American Printer
American School Board Journal
Architectural Record
Automobile Dealer and Repairer
Automobile Journal
Automotive Industries

Baker's Helper
Bakers Weekly
Boiler Maker (The)
Boot and Shoe Recorder
Brick and Clay Record
Building Age & The Builders
Journal
Buildings and Building Management
Building Supply News

Canadian Grocer
Canadian Machinery & Manufacturing News
Canadian Railway & Marine World
Candy and Ice Cream
Chemical & Metallurgical Engineering
Clothier and Furnisher
Coal Age
Concrete

Daily Metal Trade Domestic Engineering Dry Goods Economist Drygoodsman Dry Goods Reporter

Electric Railway Journal
Electrical Merchandising
Electrical Record
Electrical World
Embalmers' Monthly
Engineering and Mining JournalPress
Engineering News-Record

Factory
Farm Implement News
Fire and Water Engineering
Foundry (The)
Furniture Manufacturer and Artisan
Garment Weekly (The)

Garment Weekly (The)
Gas Age-Record
Good Furniture Magazine
Grand Rapids Furniture Record

How It Works for You

What it does for you and your field editorially is self evident, but its aditorial service is just as vital. Instead of a buyer having to depend upon gossip, hearsay and driblets of information from this or that source, he gets it all between two covers.

Yet advertising is NOT an added expense, but an improved distributive process, which takes the place of slower, more costly and less efficient methods.

That is why it pays to read advertising even more than it pays to advertise. Especially if you read it in papers which have met the exacting requirements of membership in The Associated Business Papers, Inc., for one of its standards of practice requires that a paper must decline any advertisement which has a tendency to mislead or which does not conform to business integrity.

You are invited to consult us freely about Business Papers or Business Paper advertising

LIST OF MEMBERS

(Continued)

Haberdasher (The)
Hardware Age
Hardware & Metal
Heating & Ventilating Magazine
Hide and Leather
Hospital Management
Hotel Monthly

Illustrated Milliner
Implement & Tractor Trade
Journal
Industrial Arts Magazine
Industrial Engineer
Inland Printer
Iron Age
Iron Trade Review

Lumber World Review
Manufacturers' Record
Marine Engineering & Shipping
Age
Marine Review
Millinery Trade Review

Marine Engineering & Shipping
Age
Marine Review
Millinery Trade Review
Mill Supplies
Modern Hospital (The)
Motor Age
Motorcycle and Bicycle Illustrated
Motor Truck
Motor World

National Builder
National Cleaner & Dyer
National Hotel Review
National Laundry Journal
National Miller
National Petroleum News
Nautical Gazette
Northwest Commercial Bulletin

Oil News Oil Trade Journal

Power
Power Boating
Power Plant Engineering
Printers' Ink
Purchasing Agent

Railway Age
Railway Electrical Engineer
Railway Engineering & Maintenânce
Railway Mechanical Engineer
Railway Signal Engineer
Retail Lumberman
Rock Products
Rubber Age

Sanitary & Heating Engineering Shoe and Leather Reporter Shoe Retailer Southern Engineer Sporting Goods Dealer Tea and Coffee Trade Journal Textile World

Welding Engineer Western Contractor Wood-Worker (The)

THE ASSOCIATED BUSINESS PAPERS, Inc.

JESSE H. NEAL, EXECUTIVE SECRETARY

HEADQUARTERS:

220 West 42nd Street

NEW YORK CITY



The Victor Line is Dressed for Christmas

Spot Lamps
Parking Lamps
Stop Lamps
Side Lamps
Drum Lamps
Nickel Plated
Doors for Ford
Lamps
Tool Boxes

Special Christmas
Window Display
Material and
Electros. Dealers
are requested to
write for these
special selling
helps

Now, Friend Dealer and Jobber, we have the Victor Line of lamp accessories dressed in color for Christmas business. You will welcome, we are certain, the attractive special cartons in which Victor lamps are being packed for the coming holiday trade.

Victor Lamps and accessories are big sellers all year round and the items listed here are particularly adaptable to the Christmas gift idea.

They are practical gifts to begin with and certain to be highly appreciated. They are made and finished like a piece of jewelry, of fine quality materials, by expert workmen who are real craftsmen in their line.

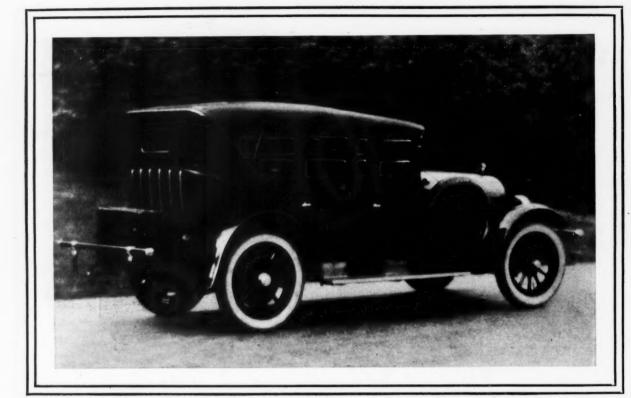
Stock the Victor line for a big and profitable season. The special cartons fit over the regular containers and may be removed if necessary. Do your Christmas stocking early. Write today.

THE CINCINNATI VICTOR COMPANY

716 Reading Road, Cincinnati, Ohio
Owners by Purchase of the Jobbers'
Division of the Corcoran-Victor Co.



AUTOMOBILE LAMPS AND ACCESSORIES



How Nine Chicago Dealers Are Reducing Their Customer Turnover

IN CHICAGO, Case motor cars are distributed by twenty-two dealers. Nine of these dealers had previously sold exclusively a "four" of merit in the thousand dollar class—the product of one of the five great producers.

They served their patrons well, these nine dealers. Yet customer after customer, after a season or two, went across the street or around the corner to buy themselves a "six."

Why!

This customer turnover was not the result of dissatisfaction or disgruntled ownership. Many expressed regret at having to sever their business relations with these dealers. There was nothing wrong. They were merely following the human urge—they wanted a "six" after having owned a "four."

Our nine dealer friends saw the light. They appreciated the necessity of adding a "six" to their line of "fours." That Case motor cars were selected from all other available lines is an eloquent testimonial to the car. And the success these dealers have met with in the sale of these fine cars is strong proof of the wisdom of their selection.

Can Case motor cars reduce your customer turnover?

J.I. CASE T. M. COMPANY, RACINE, WISCONSIN



CASE MOTOR CARS



THE SIGN OF MECHANICAL EXCELLENCE



FOR MORE THAN EIGHTY YEARS

PIRE

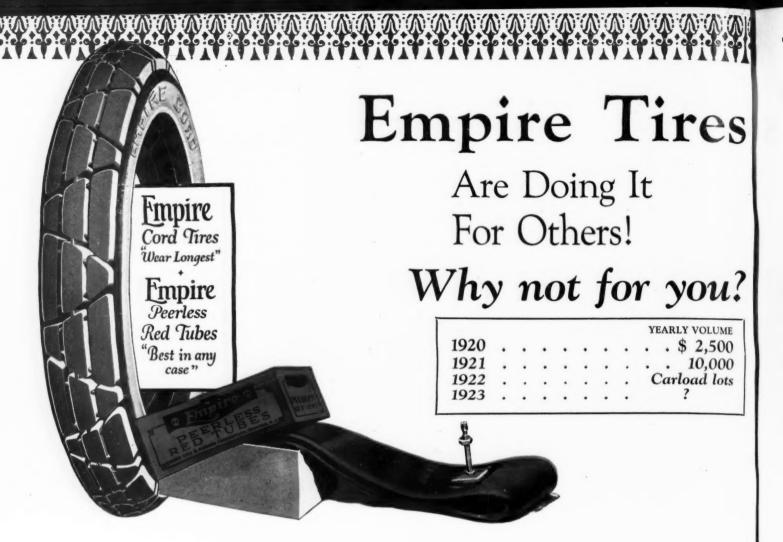




Build short orders into carload lots

PIRE

Empire Peerless Red Tubes "Best in any case"



THIS table represents the increase in yearly purchases of Empire Tires—not by one isolated dealer, but the average of many dealers whose names will be furnished upon request.

Yet we do not cater to the carload buyer with a sliding scale of discounts. The little dealer in the small town is assured the same helpful cooperation and fair prices as the big one.

Market conditions during 1923 point to heavy tonnage business for even the small dealer who starts in with such famous quality tires as Empires. The buying public has had its fill of poor, underweight, under-plied, low-mileage tires, purchased during the wild cat days of price competition, and are returning to dealers who handle those tires which from the beginning of the industry have been synonymous with long mileage, service and satisfaction.

Write today for our attractive dealers' proposition. The generous profits you can make on these long-wearing, rugged casings will truly surprise you. We invite comparison in appearance, size, weight, endurance and profit to the dealer.

Empire Tire & Rubber Corporation

FACTORIES TRENTON, N.J. U.S.A. MAIN OFFICES





SUPER-SERVICE is a Fan Belt, the living image of old man dependability himself. A belt for long trails, dusty roads, scorching turnpikes, or whatever punishment unusual travel may demand.

Super-Service is a specially constructed fan belt, light in weight, but tough, pliable and long wearing. Woven from sturdy twisted cords and finished by a process that makes it impervious to heat, oil and water. This combination means surpassing efficiency, service and dependability.

Super-Service Fan Belts come wrapped in pairs. Show your customer the twin package. Tell him these two belts permanently insure him against all fan belt troubles. Put one on his fan and the "spare," which is wrapped in a glassine envelope, in his tool-box for emergency.

Ask your jobber's salesman about Gilmer Super-Service Fan Belts. In the meantime write to

L. H. GILMER COMPANY, Philadelphia





"Ask'em to buy" Gilmer Super-Service with this New Counter Cabinet.

Here is the latest and most efficient of Gilmer merchandisers. It is an attractive allmetal counter display cabinet. It not only keeps your customers reminded of Gilmer and sells Super-Service Fan Belts, but it provides a more satisfactory method of selling them.

This cabinet will be furnished free to every dealer, stocking an assortment of Gilmer Super-Service Fan Belts. Get this cabinet and tell your jobber's salesman to keep it filled.



The Walker Jack Merchandiser fairly shouts this reminder to all motorists who come in. It magnets their attention and "Asks 'em to buy."

Only one motorist in three has a jack of any kind. Half of those who have jacks need a new one. This rich field of profit for dealers is only about half covered. Why?

We decided it was because busy dealers could not find time to "merchandise" jacks. The public did not buy more because it was not asked to do so. So we brought out this new Walker Jack Merchandiser which over 6,000 live dealers are now using with sensational results.

A Walker Jack for Every Car

You can remember when speedometers, horns and wind-shields, for example, were accessories on the finer cars. Now they are necessities on all cars. A jack is an essential every motorist should have. Sooner or later

every man gets one. Sell your customers Walker Jacks as they come in. That's what the Merchandiser does.

A Salesman Always on the Job

Every motorist who comes in is asked to buy a jack when you have this Merchandiser and it costs you no time or trouble. Your prospect can't get away from the question. It slaps him right in the face at the door. Dealers report their Walker Jack sales doubled and tripled the first month. One multiplied his sales by four.

Free with Standard Assortment

The Walker Merchandiser, costing over \$7.50 to make, comes free with a standard assortment embracing seven types of Walker Jacks, 15 in all. Ask your jobber's salesman for prices and discounts.

Walker Manufacturing Company
Racine, Wisconsin



"Dependable in Emergencies"

Through-the-Windshield

SPOTLIGHT PATENTS

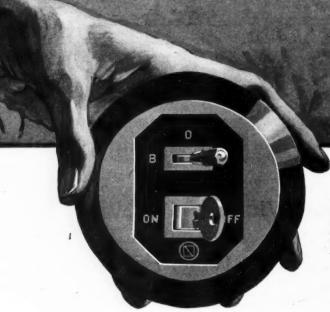
The Fyrac Windshield Spotlight is manufactured under and fully protected by Fyrac-Clymer Patents and Patents Pending, including the basic Vallot Reissue Patent, May 15, 1923. Infringement suits were filed October 8, 1923, against three Chicago companies who are marketing Through-the-Windshield Spotlights

Suits will be instituted against all infringers

FYRAC MANUFACTURING COMPANY ROCKFORD ILLINOIS

FYRAC





CONNECTICUT 190-1-Y SWITCH

Designed to work with six volts; one or two wire battery systems; two-bulb resistance dimming; selective dimming; or to change series parallel to resistance dimming, the Connecticut 190-1-Y will replace practically any switch in general use today.

Price \$4.50

Complete with instructions for mounting

The Universal Replacement Switch for Lighting and Ignition

SHOW IT

The first thing you know he will reach for it.

You won't have to tell him what a good looking switch it is. He got that at the first glance.

Neither will you have to point out the "Bright," "Dim," and "Off" positions of the lighting control. The way in which that lever snaps into position has impressed him more than anything you could say. But when he begins to manipulate the key, take the switch away from him and begin to talk.

Bring out the fact that it is a high grade Corbin pin tumbler lock—which utilizes the key as the ignition control lever.

Not only is it so designed that it locks the ignition when in the "Off" position, but so arranged that the key cannot be taken out of the lock when the ignition is "On."

Bear down on the fact that this lock is provided in so many different key combinations that there is little if any likelihood of duplication, and

Finish up with the statement that this lock not only bears the exclusive approval of the Insurance Underwriters, but earns the lowest rate of theft insurance.

You would be surprised how many times your customer will reach for this switch and never hand it back. THEY'LL BUY IT!



CONNECTICUT TELEPHONE MERIDEN

COMPANY



GONNEGTIGUT

for Economical Transportation



NEW LOW PRICES

Effective September 1, 1923

Superior 2-Pass. Roadster	-		\$490
Superior 5-Pass. Touring			495
Superior 2-Pass. Utility Coupé			640
Superior 5-Pass. Sedan	•		795
Superior Commercial Chassis		•	395
Superior Light Delivery .			495
Utility Express Truck Chassis			550

All Prices F. O. B. Flint, Michigan

Made Possible By Increased Facilities

For many months we have been able to fill less than half of our orders. To correct this oversold conditions and take proper advantage of our enlarged market, we started, some months ago, extensive building operations and purchases of material to provide for large increases in production.

Our new assembly plant at Janesville, Wis., has been in operation about six months. New assembly plants at Buffalo, N. Y., and Cincinnati, O., have just started operations. We now have seven assembly plants, and five manufacturing plants and are therefore in a position to care for our rapidly increasing market. By November we will be producing 2500 Chevrolets per working day.

Our new prices are based on the reduction in costs made possible by these increased facilities, in conformity with our fixed policy of providing the utmost per dollar value in economical transportation.

Dealers and Service Stations Everywhere

Applications will be considered from high-grade dealers in territory not already covered.

Chevrolet Motor Company, Detroit, Mich.

Division of General Motors Corporation



YOU can never lay too much stress upon your choice of Files. Consider their manifold uses in your shop and just what depends ---in dollars and cents---upon the results!

Are you providing your mechanics with the best files to work with? Have they the proper assortments of sizes and cuts? These things are vital.

Because of faster, smoother cutting, extra sharpness and extraordinary stamina, these NICHOLSON Files are the universal preference among motor and body-builders, up-to-date garages and battery service stations.

NICHOLSON Tungsten Point File

NICHOLSON Superior Platinum Point File

NICHOLSON Slim Taper File

NICHOLSON Round Bastard File

NICHOLSON Warding File

NICHOLSON Half Round Bastard File

NICHOLSON Mill Bastard File

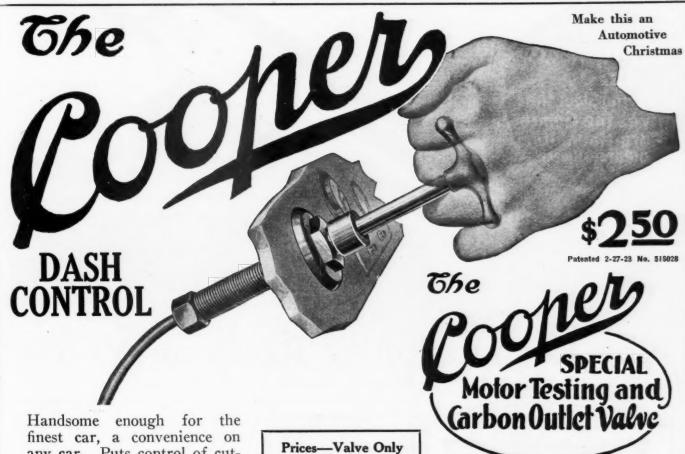
NICHOLSON Flat Bastard File

Be sure the name NICHOLSON is stamped on every File in your shop

NICHOLSON FILE CO.
PROVIDENCE, R.I., U.S.A.

NICHOLSON FILES

~a File for Every Purpose!



Handsome enough for the finest car, a convenience on any car. Puts control of cutouts, exhaust heaters, air chokes, radiator shutters, etc., at your finger tips. A twist of the wrist locks it in any position. No interference with pedals or floor board. Favorably known wherever automobiles are used.

Prices—Valve Only

1½ in. \$2.50

1½, $1\frac{3}{4}$, $1\frac{7}{8}$ 3.00

2, $2\frac{1}{8}$ 3.50

2½, $2\frac{3}{8}$, $2\frac{1}{2}$, $2\frac{5}{8}$ 4.00

2¾, $2\frac{7}{8}$, 3 5.00

Complete for Fords

When ordered complete with Dash Control add \$2.50 to above prices. Add 10 per cent to these prices on Pacific Coast.

with No. 3 pedal..... 3.00

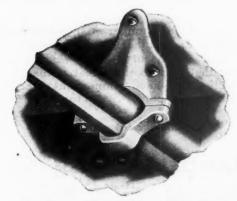
Enables you to properly "tune" and test the motor.

Gives free outlet for carbon. Keeps motor clean, saving fuel, oil and repairs. Extra heavy spring and rod axle keep valve from chattering. A size for every car—standard equipment on Paige Daytona and other fine cars.

Manufactured by

Cooper Mfg. Co., Inc. Dept. 15C, Marshalltown, Iowa

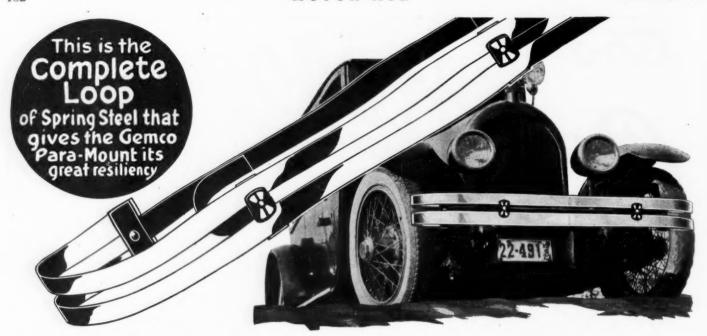




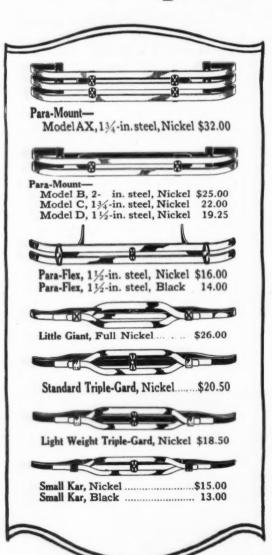
Cooper Steering Column Support for Fords.

Holds steering wheel absolutely rigid, keeping wheel from vibrating. A strong casting; black finish; fits any Ford having instrument board—open or closed models. Packed in individual cartons. Price \$0.75.

Ask your dealer. Dealer write Jobber or us.



The Responsibility Rests on You-



It will pay you to choose well the bumpers you recommend and sell your trade. If your customer accepts a bumper from you and it fails to function as it should—and it does not give the protection reasonably expected of it when the test comes—he will feel that you are the one responsible.

Gemco Bumpers Protect You as well as the Customer

They protect your customer's car against damaged fenders, headlights, radiator and wheels. The complete loop ends give ample resiliency that meets the test when the accident happens. Hence your reputation as a reliable, conscientious, dependable dealer is protected.

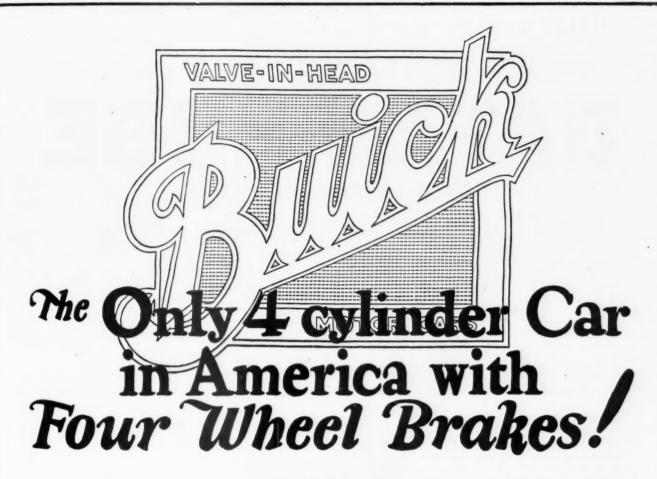
Gemco experience as the oldest Bumper Manufacturers in America, makes us leaders in designs that give the greatest efficiency, in finish that retains its beauty, in the shaping and tempering of material so that it gives that great resiliency so necessary to real protection. Gemco connections fit; they are easily attached and they "stay put". Styles for all cars.

Write for Catalog and Dealer Discounts.

Gemco Manufacturing Co.

760 South Pierce Street
Milwaukee, Wisconsin

BUMPERS



In designing four wheel brakes upon its wonderful new four cylinder models, Buick provides a four cylinder motorcar unequalled for sturdiness, power, beauty, comfort and safety. The widespread demand that met their introduction evidences how fully these models answer the need for a small car of proved dependability and performance.

All Buick 1924 six cylinder cars likewise have four wheel brakes.

BUICK MOTOR COMPANY, FLINT, MICHIGAN
Division of General Motors Corporation

Pioneer Builders of Valve-in-Head Motor Cars Branches in All Principal Cities - Dealers Everywhere

FOURS

Five Passenger Touring					\$ 965
Two Passenger Roadster			-		935
Five Passenger Sedan		-			1495
Four Passenger Coupe	-		-	~	1395

SIXES

Five Passenger Touring				100		\$1295
Two Passenger Roadster	r					1275
Five Passenger Sedan			-			2095
Five Passenger Double	Ser	vic	e S	Sed	an	1695
Seven Passenger Touring	E .		m			1565
Seven Passenger Sedan				-	-	2285
Three Passenger Sport F	coad	date	er		-	1675
Four Passenger Sport To					-	1725
Brougham Sedan -	-		-	-	-	2235
Four Passenger Coune		-				1995

Prices f. o. b. Buick Factories; government tax to be added.

When better automobiles are built, Buick will build them

GATES HOSE

"The Standardized Radiator Hose"



A simple little idea—this putting the yard-stick right on the hose—but it is saving time for 90,000 dealers now.

Made by the World's Largest Manufacturers of Fan Belts

"A Jack-of-All-Trades— Master of None"

As true in the Repair Game as any other

An automobile manufacturer does not make the electrical equipment for his cars. He believes in—

SPECIALIZATION

He knows that a company making only one product—specializing in electrical equipment—can, thru quantity production and greater experience, put out a better product for less money than he.

Why don't YOU follow every car manufacturer's example—SPECIALIZE on those jobs for which your shop is equipped. Give jobs for which you are not equipped to companies SPECIALIZING in those particular jobs. Don't be a "JACK-OF-ALL-TRADES."

Take armature rewinding for example — We do nothing else. We can save you time and money on your rewind job and give you a rewound armature equal to new. We have special tools and equipment for each and every one of the fifty or more operations in the rewinding process.

Our service will more than please your customers—We have a stock of rewound armatures and in practically all cases can exchange and ship the same day old armature is received from you.

We Guarantee Every Armature We Rewind

Satisfaction is assured.

The Proof of your profit is in the price list opposite; those prices are so low that you can make a very fair profit on every job. Just take Bearings and End Plates off and ship armature to us. We do the rest and—We Guarantee Satisfaction.

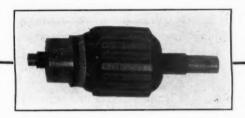
Try Us on Your Next Rewind Job

Our new plant just completed and our present capacity is 1500 rewind jobs a day.



"I Can Fix It"

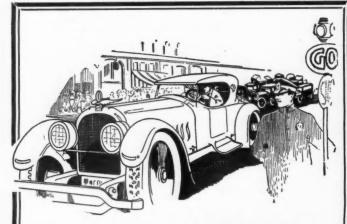
The repair man who attempts to handle those jobs for which his shop is not properly equipped is sure to get a reputation for one of two things — Poor Work or High Prices—Both are fatal to his business existence.



PRICE LIST Net Prices

Ford Generator Armatures\$	1.95
Ford Starter Armatures	2.00
Any Make of Two Unit Generator Armatures	4.95
Any Make of Two Unit Starter Arma- ture Rewound	6.75
Northeast	11.00
Simms Huff	7.00
Delco	12.00
Dyneto	12.00
Detroit	12.00
Ann Vacuum Clamar Armature	3 50

HMFREDERICKS CO. Armature Winding Specialists Lock Haven Penna.



YOU ARE SURE
of
Instant Response
and
Perfect Control
With



FOSIER sensible lightweight

PISTONS

Instant response — because of light weight, accuracy, rugged construction and that the most strenuous operating condition does not cause distortion.

Perfect control—because the heads of Foster pistons are in correct proportion with the side walls to prop-

erly absorb and distribute the heat—overheating eliminated. Also proper oil grooving and drainage prevents spark plug fouling.

As a dealer selling proposition nothing is better. Write us for information; also get our piston catalog.

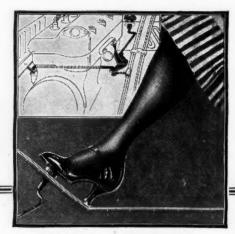
The F-J Piston Reamer

Here is the reamer that actually shows you just how far to go and how deep you are going—equally as dependable as a micrometer. Reaming both holes at once assures alignment.



See our new Reamer catalog.

Foster-Johnson Reamer Company 1056 Beardsley Ave., Elkhart, Ind.



\$2.50

The Price Sells the First One Performance the Others

Then, almost before you can realize it, you are writing the dealer for another, bigger stock of

D-P Accelerators

You know how fast the news of something good spreads along the line of garages at the back of nearly every lot in the cottage district. Plant just one D-P Accelerator in such a neighborhood, and the crop of quick sales would astonish you. Why?

That's where you'll find the Fordowners; the fellows who recognize a bargain. When they find they can get a big-car accelerator, one that makes driving safer, easier, and cheaper, that stays in order, and that they can install themselves, they eagerly buy.

That's what makes D-P Accelerators turn over so fast. To save you any effort to get that turnover, we supply a mahogany-finished display stand. It makes the D-P Accelerator explain itself. It confines most of your sales-work to taking the price and asking 'em to buy something else.

Any of the hundred selected jobbers who sell D-P Accelerators will supply you with the display-stand free with your first order of one-dozen. Write now.

Davis-Palmer Co.

4750 Sheridan Road

CHICAGO

ILLINOIS



Over 12 Million Cars and Trucks Require Service

These cars are of the many makes and each has its particular requirement in wrench equipment. True enough, most nuts are standard but their location on the car differs. This is where Walden-Worcester design comes in—wrenches that fit the location as well as the nut.

The problem in buying wrench equipment is in the selection and this has been done for you in the Walden-Worcester Service Selection Charts. These selection sheets illustrate the wrenches and itemize the nut and bolt locations with an index to the wrenches suited for each.



These charts are endorsed and distributed by manufacturers to their service stations, with advice to "Buy through your jobber." Where the flat rate is in effect these selections will cut down repair time.

WALDEN-WORCESTER

WORCESTER

MASS.

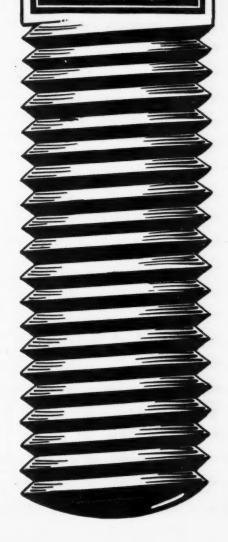


No Weak Spots

Actually Victor Bright Forged Process gives to Victor cap screws such uniform texture and toughness that there are no weak spots.

It means a lot to work with screw products that you can depend on at all times under the most trying conditions. Victor Bright Forged Process turns out screws, each as good as every other, which are so necessary for quality work and efficient production.

VICTOR-PENINSULAR CO.





Weston Model 443

Gives
Individual
Cell
Voltages

THIS Battery Testing Voltmeter with a range of 0.2-0-3 volts is the ideal instrument for quickly testing individual cells. Permits readings before battery is taken out of car or in the shop. Also permits readings of open-circuit voltage and voltage under load—as well as cadmium tests. Bakelite Case protected. Accurate. Easy to hold and handle. An instrument that pays for itself quickly in any garage or battery service station.

Send for Booklet H

It illustrates, describes and gives prices of all Weston instruments and accessories for automotive service. If only to be properly informed, you need this booklet.

Weston Electrical Instrument Co.

10 Weston Avenue

Newark, N. J.

WESTON

Electrical Indicating Instrument Authorities Since 1888

STANDARD The World Over



Your Profit is in This Big Ring

Replace broken or battered flywheel gears with EXCEL-SIOR STEEL RING GEARS and you make a double profit—a selling profit, and a shop profit for installing it.

By salvaging the old flywheel you save your customer money—by putting on an Excelsior gear you insure him against future trouble and please him.

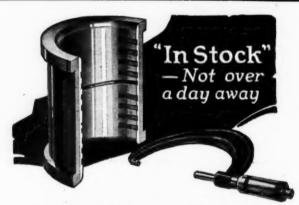
The work is simple. Machine off the stripped teeth and

shrink on an Excelsior Steel Ring Gear. It will fit and mesh perfectly with the starter pinion on any American car or truck specified.

Made of S. A. E. 1035 steel with the teeth cut and chamfered to the correct diameter and pitch to insure quiet and smooth operation. Each gear is weld tested under hydraulic pressure. Order through your jobber. If he cannot supply you, write to us.

The SPRINGFIELD MANUFACTURING CO.

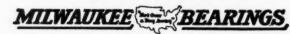
221 West Main St. SPRINGFIELD, OHIO



Built Like You'd Build 'em Yourself

Y OU'D build bearings Right, that's certain. No one knows better than you the importance of rugged precision in a bearing. They'd fit—so you wouldn't have to scrape away ALL your profit putting 'em in.
They'd stand up—so you wouldn't have to hand out alibis to your customers for things that weren't your fault.
In short, they'd be bearings like Milwaukees, because that's how WE make 'em! Ten times micrometer tested! Virgin metal! Perfect!
And don't forget—Milwaukee Bearings are always 'in stock, not over a day away'! Write for FREE list of cars, trucks, tractors, with name of stock nearest YOU—

Milwaukee Die Casting Co., Milwaukee, Wis.



A Combination

that will keep the Fan Belts turning over. The new G & K Booklet No. 504 contains complete information and data about Fan Belts.





Helps you sell G & K Leather Fan Belts

> Real steer hide belts; natural color

The Graton & Knight Mfg. Company
Worcester, Massachusetts

Automotive Division



BABBITTING BEARINGS

TORIT TORCH

"I CAN DO THE JOB IN A JIFFY"

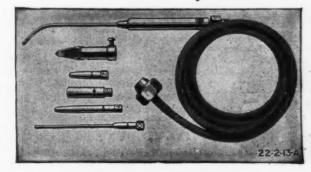
OUTFIT NO. 13

A TORIT TORCH No. 13 will not only do radiator repairing quickly and efficiently, but saves time in general soldering, wire splicing, light brazing, loosening corroded nuts and bolts, and hundreds of other jobs. Thousands in use are earning big profits.

Uses Acetylene Only

A splendid use for old auto-acetylene tanks. Easily carried to the job. Ready the instant you light torch.

Outfit complete including torch, 4 different tips, soldering copper, 5 ft. hose and tank connection \$7.50



Order from your jobber, or

ST. PAUL WELDING & MFG. CO.
169 W. Third St. St. Paul, Minn.

CRANE PULLER



The most stubborn wheel lets go when the Crane Puller is used. No fear of breakage—the Crane design and Crane materials make these pulling tools more than equal to their job.

Arms drop forged from high carbon steel, screw case-hardened with inserted tool steel point.

Three models, including the new universal Twoarm, Three-arm Crowfoot model, 4 sizes of each. Real tools for busy mechanics.

Our 24-page folder gives you the whole wheel-puller story. Write for it.

CRANE PULLER CO.

Arlington

experienced automobile mechanics prefer the

EVER-HOLD

ONE PIECE-quick ADJUSTABLE HOSE CLAMP



BECAUSE-

there are ten good reasons:

- They are assembled, rolled up and ready to apply. They have no surplus length to cut or break off.
- They can be made smaller or larger.
- They take only a few seconds to apply or remove. The nut and bolt never has to be removed.

- The nut and bolt is riveted together to prevent loss. They are made of high-grade steel or brass. They are rust-proof, practical and unbreakable. Two sizes are all that are needed in the garage. They are guaranteed by the Vitek Mfg. Co., of Omaha, Nebr.

The pioneer manufacturers of high-grade, one-piece, quick adjustable hose clamps that are used the world over.

VITEK MANUFACTURING COMPANY

Industrial Bldg.

NOTICE TO DEALERS: The jobber can supply you with Ever-Hold hose clamp. If not, write direct to us. There is money in selling our clamps—besides they sell fast and none of them come back.

The car that runs on three cylinders PUFF PUFF PUFF PUFF PUFF PUFF

That condition is usually caused by a poor spark plug. It ruins the mechanism of the car and shatters the nerves of the driver. In the end it causes the car to take a vacation in a repair shop.

"775" insulator in a spark plug indicates quality. For "775" resists heat best. It makes the plug last longer. Manufacturers who use "775" are giving you the best insulator money can buy-yet are charging no more than inferior ones cost.

FRENCHTOWN PORCELAIN CO.

Trenton, New Jersey

"Established 1910-. Busy ever since"

SEMI-STEEL REPLACEMENT PISTONS



For replacement work after a rebore or re-grind job insures your customer as good if not a better job than the original assembly.

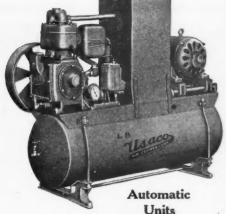
Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversizes.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio Southwestern Branch THE CARROLL CO. 2218 S. Harwood St., Dallas, Texas



Equipment LB-5 Single-Stage

per minute. Motor, 5 H.P. Working Pressure, 150 pounds. Displacement, 20 Cu. Ft.

Equipment LB-3

Displacement, 12 Cu. Ft. per Minute. Motor, 3 H.P. Working Pressure, 200 pounds.

Equipment LB-2

Two-Stage

The Simple

Compressor

or with tight

furnished as illustrated

and loose

pulleys

Displacement, 8 Cu. Ft. per Minute. Motor. 2 H.P. Working Pressure, 200 pounds.
Air Tanks, 76 Gallons
Capacity.
Capacity.

New Heavy Duty Water Cooled

Two Stage



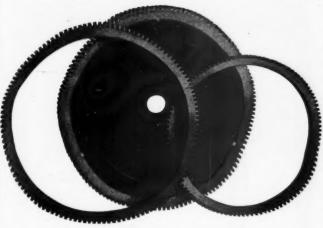
Single Stage

Here's a "bear" for service-a "husky" water cooled compressor built to withstand continuous service, hour after hour, day after day, for many years.

It is, therefore, specifically adapted for factory use, or for the large garage having many air uses in addition to tire inflating, such as: operating air hoists, air tools, and gasoline dispensing pumps, cleaning motors, opening and closing doors, etc.

This LB compressor is self contained, fully automatic in operation, compact in design, and uncommonly sturdy in construction, with all parts readily accessible. New refinements, combined with Usaco features of proven worth, afford the most practical heavy duty compressor ever designed. The price, also, is surprisingly low. "Nuff" said. Investigate at once.

> The United States Air Compressor Co. 5304 Harvard Ave., Cleveland, Ohio



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n. Ring Dept. Syracuse, N. Y.



This Growler Costs But \$4.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES 5.00
SINGLE UNIT MOTOR GENERATOR ARMATURES 10.00
MAGNETO ARMATURES \$3.75 to \$4.75

Armature Rewinding Co., Inc.

3301 Washington Blvd., St. Louis, Mo.



Time Saved Is Money Earned

By cutting down the time necessary to complete a job you are putting so much additional profit in your own pocket. A portable crane and hoist in your shop will cut down time when there is any heavy lifting. soon pays for itself.

specially for use in garages and service stations. It will stand up under the roughest treatment and will last a life time. One man can do heavy lifting with it that would otherwise require three or four men. There is nothing cheap or flimsy in its construction—it is strong and durable throughout. It is the one struction-it is strong and durable throughout. It is the one piece of equipment that every shop should have.

Write for our latest catalog which gives detailed information.

Canton Foundry & Machine Company

Canton, Ohio York Office, 203 E. 15th St. RANE HO

Spencer-Smith



Largest Manufacturers

of

Pistons Exclusively

SPENCER-SMITH MACHINE Co. HOWELL, MICHIGAN

Smoothing Out the Highways

There is an enormous market for shock absorbers with big money in their sale, provided the ones you sell require no profit eating "after sale" ser-vicing for dissatisfied customers.

Let us send you Lomar literature showing their construction, and simplicity.







Aside from Necessary Protection

Motorists get snug fitting good looking covers when they buy Campbell Radiator and Engine Covers. Thorough protection is possible only when the covers are tailored to close up every opening-every corner, and Campbell Covers go on like a glove, without wrinkle or stretching. The outer fabric protects against sleet, snow and biting winds. The inside is lined with warm Kersey.



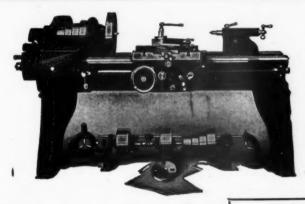
CAMPBELL Radiator and Engine Covers

Scientifically tailored to fit almost every model of every make of car.

The Perkins-Campbell Co. 622 Broadway, Cincinnati, Ohio

New York

Chicago



Biggest Lathe \$450 Value Today

A genuine Carroll & Jamieson 15-inch quick change double back-gear, engine lathe complete with countershaft, two steady-rests, and two faceplates, designed especially for use in garages and service stations. Price now only \$450. Has 32 changes of feed and thread. 9 spindle speeds from the 3-step driving pulley. Everything so simplified that average garage mechanic can operate it and do a first-class job. Although this lathe is rated 14-inch swing, the actual swing over the ways is 15¼ inches.

There is as much difference in the quality of lathes as there is in cars. You know quality in cars—see that you get it in the lathe you

13", 15" and 16" sizes—5 to 12 foot lengths of bed. Twenty years' experience back of every C & J Lathe. Get your catalog and latest Discount Sheets.

Carroll-Jamieson Machine Tool Co. BATAVIA, OHIO

High Lustre Finish
For Everything Varnished
or Enamelled

The Automobile Cleaner

that's profitable to Jobbers and Dealers in every market where

Makes good against whatever competition! And so, repeats and repeats again until it becomes a standard moving line with a known profit curve upwards.

Six Years before the Trade, National Distribution

You prove its quality with a sam-We'll send you one gladly with full particulars.

Sold through Jobbers exclusively, who are fully protected

H. L. Feasel's Laboratory

9-11-13 Desbrosses Street New York



Sell

Radiators For Fords

there are five Reasons



- The HONEYCOMB CORE has a greater cooling area. In Winter the core expands with freezing water and will not burst.
- The "BACKBONE" gives rigid support to the core and protects it from road shocks. It also acts as a reinforcing member on the chassis.
- The INTERCHANGE-ABLE SHELL is of the same dimensions as the

original Ford shell. The Atlas core alone can be installed in the old shell.

- The GUARANTEE that comes with every "At-las" is a written bond for your protection.
- The PROTECTION you get with Atlas Radiators is insured by the use of fine materials, by expert workmen, under ideal workmen, under working conditions.

Your jobber Stocks Atlas Radiators for ready delivery. Ask for details.

The Steidle Manufacturing Company Cincinnati, Ohio

The A. C. Vanderpoel Co., Inc., 11 Moore St., New York City. Exclusive Foreign Distributors.

Send For Our

NEW PRICE LIST

Our new catalogue just off the press gives reduced prices on our reliable line of battery plates and parts. You can now get these highquality plates at about the same price as ordinary plates. You can guarantee our products, and your guarantee will stand up.

GENERAL STORAGE BATTERY CO.

2005 Locust Street, St. Louis, Mo.

TOHNSON No. 300 **Melting Furnace**

Will melt 150 lbs. of soft metal quicker, cheaper and less trouble to operate than any type Furnace. Does not require a forced air

blast. Installed instantly by connecting to city gas pressure and consumes only 40 cu. ft. of gas per hour.

Complete with Melting Pot—

\$25.00

Write for catalog of Gas Appliances.

OHNSON GAS APPLIANCE Cedar Rapids @ IOWA



ANCHOR Automobile Lamps

You profit more by selling Anchor lamps. Seven years of close study and experience is in their design. The materials in them are the best the market affords. They give good, long service without complaints or make-goods. Our low manufacturing and selling costs allow you to make an

extra margin of profit.

A sufficient stock of Anchor lamps requires small investment, and is cleaned out quickly by the constant demand. Jobbers and dealers both make money on the trouble-free Anchor line. Send for size and price lists with generous discounts.

ANCHOR ELECTRIC CO.

557 W. JACKSON BLVD.

CHICAGO, ILL.

DISTRIBUTORS WANTED



For National **Automobile Spring Lubricating Covers**

Now is the time to sell them—Winter's snow and ice and frozen roads are hard on exposed, unprotected springs. The NATIONAL is a grease cover, the grease being absolutely retained in the cover by patented felt pockets. This is an exclusive feature found only in the NATIONAL. Only best quality materials are used in manu-

Car dealers and distributors-let us give you our proposition.

NATIONAL AUTO SPRING COVER CO. 169 Brighton Ave., Allston, Mass.

ARANITE CABLI Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD IF IT'S PARANITE IT'S RIGHT

Quality jobbers handle quality cablethat's PARANITE.

Indiana Rubber & Insulated Wire Co.

810 Marquette Bldg., Chicago Factory and General Offices—Jonesboro, Ind.

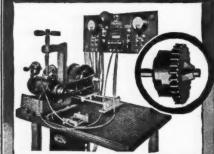


The Bearings Company of America, Lancaster, Penna.

Manufacturers of—Angular Contact Radial Bearings, Angular Contact Thrust Bearings, Thrust Ball Bearings. All Bearings made to your requirements and Blue Print dimensions. Your present Bearing sizes duplicated. Western Sales Office

1012 Ford Bldg., Detroit, Mich.

EXCELSIOR TEST BENCH With the Positive Drive and Speed Control



INCREASE YOUR PROFITS!

Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

The Excelsion **Test Bench**

equips your shop com-plete for this work.

Price \$385.00 Payable \$50 per m Write for bulletin 975M

EIDENHOFF CHICAGO HEL HE

HEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau of Circulations.

It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of Motor Age, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.

Exclusive Territory Granted For Handling Rewound Armatures

We Are Specialists in This Line



Work and Service Guaranteed

PRICES

Fords Generators, all makes.... \$3.25

All other work in proportion

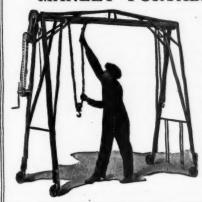
Local distributors acting as our agents can make a snug profit with very little time or effort. One trial makes a customer, convincing him of the quality of our work. Write for particulars.

PIONEER ARMATURE CO., Inc.

2805 Cottage Grove Ave.

Chicago, Ill.

MANLEY PORTABLE HOIST



A Universal Garage lifting method without an equal. The Manley Hoist is su-perior because the chains can be positioned anywhere can be positioned anywhere between the legs, thus raising the load always vertically. The legs are doubly braced and will not spread. Automatic brake to lower the load. Legs folded together and Hoist may be placed against the wall entirely out of the way. Two leverages with corresponding speeds. Light, strong and easily moved. and easily moved.

Send for Catalog.

MANLEY MFG. CO. York, Pa.



& D STEERING COLUMN BRACE



Proven!!!



The great value of the D. & D. steering column brace for Fords has been absolutely proven. All new Fords are now factory equipped with a brace of this kind. But there are six million Fords running not originally equipped. Over 250,000 of these have bought the D. & D. brace. There will be hundreds of thousands more sold because it makes steering easy over the roughest roads.

Notice on the new Fords what a brace of this kind means, then order the D. & D. from your jobber. Installed in two minutes without drilling or boring. If your jobber doesn't carry it in stock write us direct for a trial order of six or a dozen, but please be sure to send affected in any way by climatic conditions. List price \$1.50. Liberal discounts. Built up to a standard — not down to a price.

Manufactured by

L. H. Daley & Co. Columbus, Ohio

Make the Big Money in Winter Overhaul Jobs

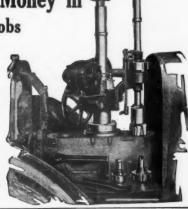
Cylinder renewing offers the big money in winter overhaul jobs. Are you equipped to keep this profit yourself?—or must you let it get away to others?

Stormizing Machines
Will handle all your cylinder renewing. Will add a big profit to your winter shop jobs. Look into this better method of cylinder refinishing. Send today for our book: Modern Cylinder Methods.



MANUFACTURING CO.

406 A Sixth Ave. So. Minneapolis, Minn.





Re-Babbitted Bearing Exchange

Our Re-babbitted Bearing Department is over two years old. Over 200,000 Con. Rods have been shipped. Less than one to each 2,000 have been returned as faulty. We have over 5,000 SATISFIED DEALERS in 16 States. We Re-babbitt ANY Bearing that has ever been Babbitted. Special undersize for Re-ground crankshafts

ever been Babbitted. Special undersize for Reg. onto the part of t

Fremont Foundry & Bearing Works 1340 W. 5th St., Oklahoma City, U. S. A.



This Is Why:



Insulator — Steatite — an artificial stone, practically unbreakable and not affected by heat. An important Robert Bosch feature.

Valve seat principle, insuring gastight fit when plug is assembled.

Electrodes nickel alloy—adding ex-tra long life to plug and reducing distortion of electrodes to minimum.

Crescent shaped side electrodes, producing a ribbon of flame, in-creasing considerably surface of electrical discharge, offering less electrical resistance.

A two-piece plug easily taken apart for cleaning.

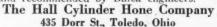
Attractive territory open. Write us.

Robert Bosch Magneto Co., Inc.

Robert Bosch Magneto Co., 1882.
OTTO HEINS, President
123 West 64th Street
Chicago Branch: 1302 South Wabash Ave.
The Genuine, Original Bosch Means Robert Bosch
Only

Profit in Flat Rates

The Hall Cylinder Hone turns out a perfect job, cuts labor cost and keeps your customer's car from being tied up. O. K.'d and recommended by Buick engineers.







Let us send you our FREE Catalogue on

Huetter Machine & Tool Co.
Indianapolis, Ind.

546 Kentucky Ave.



Six design and style bumpers from which to make selection for all popular make cars

Write for details.

THE BELLEVUE MFG. CO. Bellevue, Ohio



Motor Wheel Corporation, Lansing, Michigan

PISTON RINGS

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, pre-vent spark plug fouling and reduce carbon for-

Write for interesting circular on oil pumping and details about this fast selling piston ring.

THE WELEVER PISTON RING CO.
Toledo, Ohio 1713-15 Canton St.

The Francisco Auto Heater-

-Made in 60 different models for all makes of cars-heats both closed and open cars. Gives from two to three times as much heat as any other heater.

THE FRANCISCO AUTO HEATER MFG. CO.

Columbus, Ohio

TAKE THE END PLA WITHOUT PULLING THE MOTOR



THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year, List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.
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EATON

for Beauty-Strength-Endurance

Made of the Super-Steel

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The EATON AXLE & SPRING COMPANY

AXLE SHAFTS and SPRINGS

For all makes of cars. Keys, key-stock and nuts for all shafts. Dif-Calledia ferential gears for all cars.

BUTLER AUTOMOTIVE STEEL COMPANY Easton, Pa., 101 D Street



Send Us Your Re-Babbitting Jobs

We Re-Babbitt connecting rod or main bearings for any make car, truck or tractor (including Orphan car bearings)—use Genuine Babbitt of S. A. E. specification—align rods—duplicate oil grooves—furnish Wrist Pin Bushings, Bolts and Nuts at cost when needed—give 24-Hour Service on Mail Orders—absolutely guarantee our work—at a cost to you considerably under that of a replacement bearing—Write for price list.

Interstate Bearing Co., Herkimer, N. Y.

ECLIPSE Safety SHADE

Instantly adjusted to any desired shading position with one hand from driver's seat. Makes night driving safe. One size for all cars. Write at once for our plan of distribution and full details.

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Subsidiary of Spicer Mfg. Co.



NONE BETTER

Jobbers, Dealers. Read the merchandising story of this great wrench-set in our full-page announcements appearing in this magazine every other week.

Screw Products Department

The New Britain Machine Co. New Britain, Conn.

"DICKERSON" SERVICE JACK For Quick Work On All Cars!

Pick it up by the handle—large 4 inch wheels make it easy to roll under axle—a few turns and car is raised. Great for Tire and Accessory Stores, Vulcanizers, Wheel Repairers and Garages. Write for catalog of "Time Saving Shop Equipment."

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JOBBERS DEALERS DISTRIBUTORS
When a car owner sees this piece of equipment he
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Small cash payment brings you HB 8-hour battery charging outfit. Easy terms of only \$20 monthly let your profits pay balance with nice surplus besides. 30 days' free trial on money-back guarantee lets you try 8-hour battery charging at our risk. Start now to make big profits. An HB outfit has one-third more battery capacity than any other outfit on the market of similar rating. Write today for information. Hobart Bros. Co., Box AR 1, Troy, Ohio.



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If it isn't, it will be worth your while to investigate the Dragon franchise, because Dragon dealers, without exception, are making money and building a permanent business.

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Englert Manufacturing Co.

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Each successive blade cuts AT A DIFFER-ENT ANGLE from the one before it.

DIFFERENT ANGLES

No CHATTER, no DIGGING INeven in keyed holes.

TWICE the expansion of others. All sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN REAMER-Wonderful Time-saver.

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Stop Scraping Motor Bearings

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100 per cent bearing in 15 minutes. Wrist Pin Bushings Reamed in perfect alignment. Forces out Wrist Pins. Tests squareness of Wrist Pins and Pistons. The most important Labor Saving Tool in shop equipment.

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Electric Drill and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co. Louisville, Ky., U. S. A.

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Announcement of The MARVEL Radiator Cap

A new and attractive winged cap for the 1924 motorist-Also in the Bar Type.

Sold through the jobber. Manufactured by:

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Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less service and a better core for less money. No need to carry large stocks of cores, and no damage in shipping. Increase your vol-ume of business. Send for illus-trated booklet describing our radiator core equipment.

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CAN NOW HAVE

THREE-SPEED Transmission

This transmission has three speeds forward and one reverse and re-places the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third or high is the same as the Ford high and second is halfway between.

Cronk Simplex Sliding Gear Transmission

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Write today for other interesting details.

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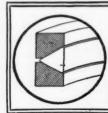




YALE OILING SYSTEM FOR FORDS

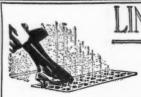
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Wedge-Rite piston rings are 3-piece rings following the best engineering practice. The patented wedge takes up the wear, keeping the groove and cylinder wall tight against oil and compression leakage. Wedge-Rite Piston Rings are made from the best individual castings. Wedge-Rite Plattsburgh, N. Y.



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Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.

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Screw gauge to dash or instrument board; connect copper tube with elbow in place of lower petcock. No oil passes thru tube or gauge. No moving parts, floats or plungers. Easy to sell; easy to install. Big money-makers.

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Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer ing, spring breakage proposition. W. D. LOWE & CO. 204 Mound St., Columbus, Ohic

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Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

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A Type and Price for Every Customer
Write for descriptive literature on 76 Adco Products, giving your jobb
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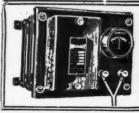
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Adjustable to all positions.

Two models—all nickel finish \$10.00. Two sizes, Senior model 5½" in diameter. Junior, 4½". Black enamel \$8.50, Junior size only.

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The Thal & Bitter Machine Company
TOLEDO, OHIO



Motor Age Winter Service Issue November First

THE LINLEY (Adjustable) Universal Ball Cover for Fords

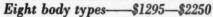
Eliminates that noisy rattling, bumping and back-lash in the rear axle. Saves universal joint, be-cause it keeps the grease inside, where it belongs. Jobbers and Dealers: Write today for our attractive proposition.

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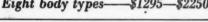
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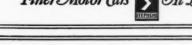
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KALAMAZOO

FRONTENAC CYLINDER HEADS

CYLINDER HONES

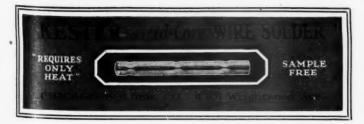
Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



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The remarkable showing of the Fronty-Ford in the 500-Mile Race at Indianapolis May 30 was due solely to the performance of the Frontenac Cylinder Head. This Head is adapted for use on your Ford car by its designer and builder, Arthur Chevrolet. Write for FREE Catalog. Book, "How to Build a Fronty-Ford," \$2.00; free with orders of \$50.00 or more.

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Noiseless Timing Gears

Install quietness—Cloyes NOISELESS Fiming Gears. They give the motor a soft, even "purr"—permanently.

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Prevent Costly Repairs. Dis-tribute the Shocks. \$12 a Set —Parcel Post Prepaid in U. S. A.

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State Representatives Wanted
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Equip Your Shop HOYT Electrical Testing Instruments Burton-Rogers Co., Boston, Mass.



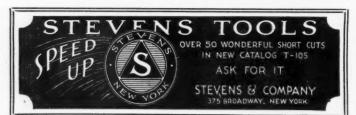
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Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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Should Be On Every Car You Sell

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price.

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THREE PRODUCTS YOU NEED ZIP FRICTION PASTE, for fitting in bearings. ZIP GRINDING COMPOUND, for valves. ZIP LAPPING COMPOUND, for lapping in

The Original Write For Samples Ask Your Jobber. Water Mixed. THE ZIP ABRASIVE COMPANY Cleveland, O. U. S. Pat. 1353197 THE ZIP MFG. CO. Denver, Col.



The Aristocrats of Motordom

7 Models-Open and Closed Distributors in principal cities. Open territory now

being closed. Kissel Motor Car Co. Hartford, Wis.



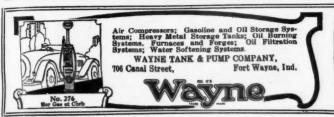
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Monarch Valve Grinding Compound, "The Quality Compound" since 1907, Packed in 4-oz. boxes—2-3 coarse, 1-3 fine—List 50c.

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Similar reports about the Optoshield are coming in constantly from all parts of the country. This accessory has taken its place among the most popular sellers in recent years.

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Welco Accelerator
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Easily installed—one hole to drill.
Works independent of throttle. Any
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In colored carton complete with instructions. Write your Jobber.
Also makers of Welco. Step
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Works like a pencil sharpener. No chatter-marks; a finish equal to any lathe job—in a few minutes. Does a real job. Built by TOOL-MAKERS. Circular.

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MOTORBLOC CORPORATION Summerdale, Philadelphia, Pa.

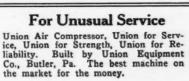


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Always used where safety and service are the first and only consideration.

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The Allen Manufacturing Company, Hartford, Conn.

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ABSORBER

More than a Shock Absorber because it fluid-cushions all movements between the body and the chassis—gives a new experience in riding comfort.

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tidy, quick, and easy profit. Garages everywhere are stocking anti-freeze solutions against the coming of the cold-weather demand. They will buy

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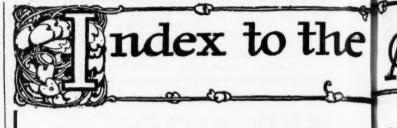
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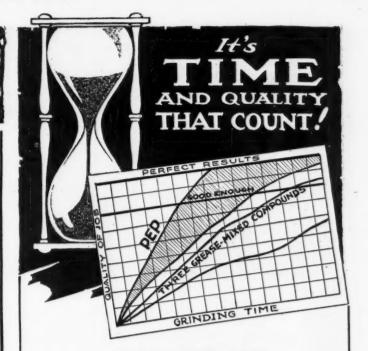
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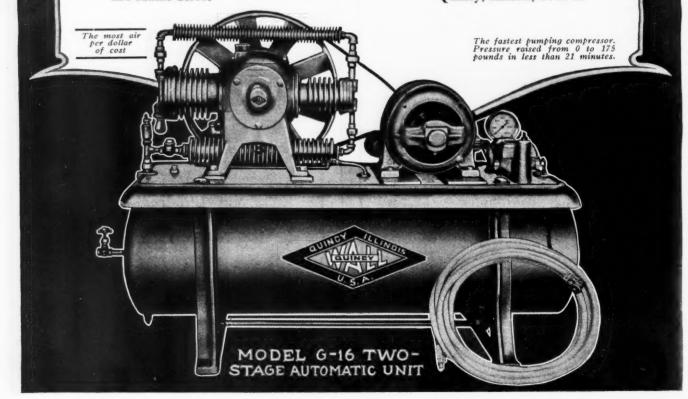
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